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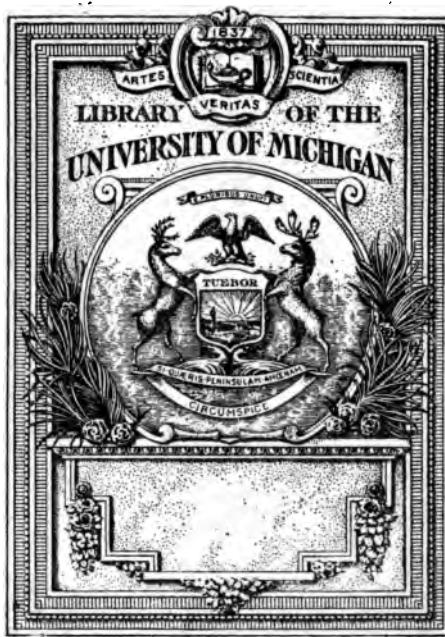
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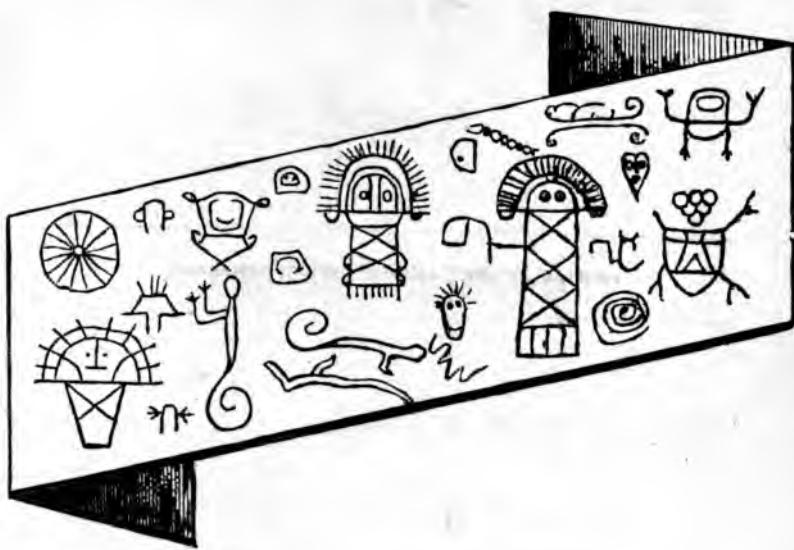


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The "Schomburgks" in Guiana.

By James Rodway, F.L.S.

UP to the time of ROBERT SCHOMBURGK'S explorations, the interior of this country was almost unknown. The great lake of Parima was still retained on most of the maps of South America, but the best geographers had already expressed doubts as to the existence of any very large body of water in Guiana. HILLHOUSE had made some journeys up the Massaruni and also partial explorations of the country between the Essequebo and the Orinoco, but the upper districts of our great rivers were less known than they had been a century before, when the Dutch post-holders must have had a good knowledge of the country. HUMBOLDT'S researches had left Guiana unexplored; he says,— “With respect to the continuation of the system of the mountains of Parime, south-east of the meridian of the Essequebo, the materials are entirely wanting for tracing it with precision. The whole interior of Dutch, French and Portuguese Guiana is a *terra incognita*, and the astronomical geography of those countries has scarcely made any progress during the space of thirty years.”* The Royal Geographical Society of London considered it a matter of great importance, to connect HUMBOLDT'S observations with those made on the coast of Guiana, and for this purpose ROBERT HERMANN SCHOMBURGK was chosen in 1834.

This gentleman was then thirty years old, having

* *Humboldt's Narrative* (Bohn) III. 343.

been born on the 5th of June 1804, at Freiburg, in Saxony. Having been unsuccessful as a tobacco planter in Virginia he proceeded to the West Indies in 1830 and surveyed the island of Anegada, his report of which brought him to the notice of the Geographical Society. Writing in 1834, Dr. W. J. HOOKER spoke of him as a very accomplished naturalist, favourably known to science by an interesting history of Anegada, and to the Botanist still more favourably, by his excellent observations on the cultivated plants of the West Indies, lately published in "Linnea".

Considerable interest was felt in SCHOMBURGK'S expedition by naturalists generally. HOOKER trusted "that the Atlantic side of South America would soon be better known to Botanists by the researches of Mr. SCHOMBURGK, who had offered his services to explore the banks of the Orinoco, and it was hoped that he would shortly embark from Tortola for that interesting country."*

His instructions from the Secretary of the Society were dated November 19th 1834. The expedition was to have two distinct objects; first, thoroughly to investigate the physical and astronomical geography of British Guiana, and, secondly, to connect the positions thus ascertained with those of HUMBOLDT on the Upper Orinoco. The two undertakings were to occupy three years, the second object to be commenced after the completion of the first. Towards the expenses the Society contributed £900. He was directed to proceed to Demerara, where he would receive further instructions from the Governor, Sir JAMES CARMICHAEL SMYTH.

* Hooker's Jour. Bot. I. 179.

All geographical information was to be considered as the property of the Society, but his collections were to be at his own disposal, with the exception of one set of natural history specimens to the British Museum, and a geological collection for the Geological Society. For the first year or eighteen months, everything was to be subordinate to the object of investigating the physical character and resources of the great central ridge which furnishes tributaries to the great rivers of British Guiana. When this was finished he was to pass the mountains, and connect his positions with those of HUMBOLDT. As the expedition could not begin till August, SCHOMBURGK need not arrive in Demerara before June.

He arrived in Georgetown on the 5th of August 1835, where he stayed for six weeks, his delay being caused by the unusual length of the rainy season. The Governor took great interest in the expedition, but the planters and inhabitants generally were so much taken up with the political squabbles of the time, that his arrival was hardly noticed. The great question of Emancipation had ended in what the planters considered as a defeat, and what with the disputes respecting the compensation money, and the new laws for the apprenticed labourers, the relations between the Government and the estate-owners were very much strained.

On the 21st of September, he proceeded to the Essequebo Post, which stood on the site of what is now the Penal Settlement, for the purpose of engaging corials and Indians for the expedition. While waiting for the final arrangements, he made a short trip up the Cuyuni, making observations, and collecting a few specimens. Leaving the post on the 1st of October, the expedition,

consisting of 22 persons, including himself and Lieutenant HAINING, embarked in three corials, and proceeded up the Essequebo. His first object was to ascertain the source of this river, and the nature of the country through which it runs. Arrangements had been made for a probable absence of six months, and every convenience possible had been provided, including credentials to secure respect from the authorities on the frontier.

On arriving at the Creek Annay on the Rupununi, October 23, temporary head-quarters were established, and letters, reporting progress, forwarded to Georgetown, where they were reported as having been received on November 19th. From a letter to Mr. GEORGE BENTHAM,* the Botanist, it appears that all the party had suffered more or less from fatigue and exposure ; fever and dysentery having been the prevailing disorders, but in no cases however to a dangerous degree. His own servant insisted on going back with the people who had been hired at the post, having become alarmed at his own indisposition, and the accounts of tigers and rattlesnakes, the latter of which had paid several visits to their Indian huts. He had already collected about 2,000 plants, and expected to find the savannahs a rich field. When Lieut. HAINING should leave him in about three months, he would send his collections of plants, birds and minerals ; the opportunity of the people then leaving he did not consider sufficiently safe. He had enclosed a paper on the species of *Lacis* for the Linnean Society, and had drawings of several other plants, but was too weak from fever and ague, to finish the accounts of them.

* Hooker's Companion to Bot. Mag., Vol. I.

From Annay our traveller ascended the Rupununi as far as the lightest canoe could go ; visited Lake Amucu, the supposed Lake Parima, stood on the highest ridge of the Parima Mountains, and obtained specimens of the hitherto unknown plant from which the Wourali poison is made.

Letters were received in Georgetown on the 23rd January, 1836, (dated December 5th, 1835), from Pirara, by which it appears that the health of the party had improved. SCHOMBURGK spoke highly of the kindness of Senhor CORSEIRO, Commandant of Fort St. Joaquin, who had supplied him with horses and a canoe, and helped him in many other ways.

Lieut. HAINING left the Rupununi on February 6, to return to Georgetown. On his arrival, the *Royal Gazette* spoke of the difficulty in obtaining information as to the expedition, on account of the arrangement with the Geographical Society. The travellers had in no instance diverged far from the banks of the rivers, there had been therefore no time for Geological researches. HAINING left some specimens of cotton, tobacco and Indian corn, at the Commercial Rooms, for public inspection. A collection of plants was forwarded to England, as well as other natural history specimens.

After the departure of his companion, SCHOMBURGK returned from the Rupununi and proceeded up the Essequebo, where he discovered a large tributary which was named by him Smyth's River. The expedition was at length stopped by an impassable barrier called after the King, WILLIAM IVth's Cataract. The expedition then returned and arrived at Bartica on the 18th of March. By an accident at Etabally Falls, one of the corials was

upset, and a large portion of the collection of plants lost, including most of those from the Savannahs. On opening those that remained he found many utterly destroyed by damp, and quite useless. Although the losses were so serious the results of the expedition were by no means meagre, 66 specimens of birds were sent to the British Museum, several Botanical papers, and accounts of *Strychnos toxifera* (Wourali) forwarded to the Linnean Society, 170 species of plants, some seeds to the Horticultural Society, and several living Orchids. A number of Astronomical observations had been made, being the commencement of the series that would ultimately connect with those of HUMBOLDT'S. HOOKER, in speaking of SCHOMBURGK'S return to Demerara said :—" The perils of such an undertaking none can estimate except those who have visited similar countries."*

SCHOMBURGK'S second expedition to explore the Cor-entyne left Demerara on the 2nd of September. He was accompanied by Mr. VIETH, an ornithologist, Mr. HERAUT, a draughtsman, and Lieutenant LOSACK and Messrs. CAMERON and REISS as volunteers. Proceeding from Mary's Hope on September 19th, he ascended the river as far as some falls, which he named Smyth's and Barrow's cataracts, where his progress being arrested, he was obliged to return to Berbice early in November.

On the 25th of the same month he left New Amsterdam with the same party, except Lieut. LOSACK, and proceeded up the Berbice River, where he discovered the Victoria Regia. From a place where the river was about thirty yards wide, he crossed by means

* Companion to Bot. Magazine Vol. II.

of an Indian path, to the Essequebo, the journey being accomplished in 3 hours and 20 minutes. There was not the slightest trace of the Demerara River to be seen at this place. Returning to the Berbice next day, he was obliged to proceed down that river on account of being short of provisions. In coming down the Christmas Cataracts, Mr. REISS was drowned by the upsetting of a corial. Undaunted by starvation or the continual drenching rains, after a few days rest at Wickie, he started up the Wieronie Creek, and proceeded partly by canoes and then overland to the Demerara River, where he arrived at Seba, and visited the Great Falls. Returning to the Wieronie he made a short trip to the Upper Canje, and returned to New Amsterdam on the 30th of March 1839.

His collections in this journey included 58 birds, 400 Natural History specimens which were unfortunately lost on board of a vessel wrecked on the voyage home, and 8000 plants of 400 species. The other results were however almost left in the shade by the discovery of *Victoria Regia*. This wonderful plant, of which SCHOMBURGK sent coloured drawings to England, was first made known to the scientists at a meeting of the British Association, on the 11th of September 1838. Almost immediately, descriptions were published in all the scientific journals, and almost every newspaper. It having been named after the young Queen, together with its grandeur and beauty, helped to bring it into more notice than perhaps any Botanical discovery ever made. The colonists even began to wake up a little and to pay some attention to the expeditions. Copies of the narrative from the Geographical Journal were laid on the tables at

the News Room, and some enthusiasm began to be felt in the colony.

Our traveller certainly seemed to have plenty of energy, as he made a careful survey of the mouth of the Corentyne, during the month of June.

Returning to Georgetown he suffered from a severe attack of yellow fever, which delayed his departure on what was to be his longest journey, to explore the sources of the Essequebo and connect his observations with those of HUMBOLDT. After his recovery he left Georgetown on the 12th of September 1837, accompanied by Mr. VIETH his assistant naturalist, Mr. MORRISON a draughtsman, and Mr. LE BRETON who superintended the Commissariat. The expedition was fitted out at Post Ampa, from whence it proceeded to the Rupununi, and then through its tributary the Rewa, overland, where SCHOMBURGK arrived in the Essequebo at some distance beyond the falls which had formed the obstacle to his first exploration. After a further toilsome journey partly in canoes, and partly by fatiguing marches he reached one of the sources of the Essequebo. Returning to the Rupununi, he stopped three weeks to recruit, whence proceeding to Pirara, he remained with Mr. YOUD, the Missionary, to await supplies from Georgetown. While here he explored the Canuku mountains, and after the arrival of his boats proceeded with Mr. YOUD to Fort San Joaquin, where he was received with great civility. For nearly three months he was employed here in exploring the surrounding country, making observations, and collecting. Returning to Pirara in September 1838, he finally left the Mission on October the 8th to commence a most toilsome journey to Esme-

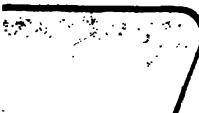
ralda on the Orinoco, where he arrived on the 22nd of February 1839. In speaking of his first sight of the goal of his wishes, he said :—" I cannot describe with what feelings I hastened ashore ; my object was realised, and my observations, commenced on the Coast of Guiana, were now connected with those of HUMBOLDT." After a stay of four days, he proceeded down the Orinoco to the Cassiquiare, through that river to the Rio Negro, thence up the Rio Branco, arriving at Fort San Joaquim on the 22nd of April. Reaching Pirara he found the Mission in possession of a detachment of Brazilian soldiers, and the Indians dispersed. He came in sight of Bartica on the 17th of June, where the inhabitants fired salutes and hoisted flags to give him a hearty welcome.

The feeling in the Court of Policy, which had been rather antagonistic at first, especially as regarded the annual vote towards the expenses of the expeditions, began to take a turn in their favour. At the sitting of the Court on December the 19th 1838, Governor LIGHT read a copy of one of SCHOMBURGK'S letters which called attention to the expediency of affording some protection to the Indian tribes on the Brazilian frontier. The Governor moved a resolution " that this Court will take into its favourable consideration the expediency of adopting such measures as it may deem practicable, for promoting the civilization of the Indian tribes in the remote parts of the colony," which was passed, the elective members however trying unsuccessfully to add the words, "as far as might be consistent with the diminished resources of the colony." The Honourable Mr. MACRAE spoke of SCHOMBURGK'S recommendation " that the Boundaries of the Colony

should be properly defined," and said that this was highly desirable. The Pirara expedition of 1842 was the outcome of this resolution, and the reports of the traveller.

SCHOMBURGK went to England in October 1839, taking with him three of the Indians who had formed part of his boat's crew. These aborigines are figured in the letter-press of the "Views;" one was a Warrow named CORRIENOW, the second SARAMANG a Macusi, and the third SORORENG a Parawano. While in London, they were introduced to the Aborigines Protection Society at Exeter Hall, and were viewed with very great interest by the visitors to the Guiana Exhibition which the traveller had opened in London at 209 Regent Street, during the winter of 1839-40. The Exhibition was arranged in a room which had been decorated with scenic foliage, amidst which stood the model of an Indian benab, fitted up with hammocks and all necessary utensils. The Indians were dressed in tight-fitting clothes painted with roucou, to give the appearance of nature, but notwithstanding this partial covering they were stated to have cowered over a fire, shivering with the cold. They displayed their skill in shooting with the bow and blow-pipe. Around the rooms were arranged the collections of birds, quadrupeds, insects, geological specimens, Indian implements, &c., and a fine series of drawings of scenery and plants, special prominence being given to a life-size drawing of the Victoria Regia.

The "Description of British Guiana" was published in the early part of 1840 and at the same time the "Views," were being offered for subscription. A large number of both works were sold in the colony,



RICHARDSON & CO., advertising the first as being on sale on the 14th of July.

At the Anniversary Meeting of the Geographical Society held on the 25th of May 1840, one of the gold medals was presented to SCHOMBURGK with the following complimentary address :—

“ Mr. SCHOMBURGK,—By favour of Her Majesty the Queen of these Realms, the Royal Geographical Society is authorised to apply the medal now before me to the encouragement of geographical science and discovery, and it is in the conscientious discharge of the duty which has thus devolved upon them, that the Society has determined to place in your hands this honourable testimony of their approbation and esteem. Sir,—In the arduous journey in which you were engaged during a period of five years, you faithfully complied with the instructions, and more than fulfilled the expectations of your employers. Guided in the first instance, by the footsteps of your illustrious countryman Baron HUMBOLDT you afterwards visited a country in which no one had preceded you. A problem which he began to solve you have brought to its conclusion, and by your joint observations we have now astronomically determined a connected series of fixed points along a line extending from the Atlantic to the Pacific. Nor is it in this respect only that we recognise in you the qualities of your great predecessor ; like him, you are distinguished by the variety of your talents, and the extensive range of your studies. The zoologist gladly recognises in you the discoverer and describer of several species of birds and fishes,—the botanist of many plants before unknown to naturalists. An account of your geographical observa-

tions, given in the order of their occurrence is reported in our Journal ; and in the work which you have since published, and in which you develope for the first time the great and unexpected resources of British Guiana, you have rendered an important service to those of our conntrymen who hold property in that colony. The map which you have constructed, and which the Society is about to publish, bears ample testimony of your ability as a physical geographer. The able and affecting appeal which you have made in behalf of large tribes of our fellow-men and fellow-subjects. with whose merits and sufferings we were previously unacquainted, has not been made in vain ; and you are now about to return to the land of your former wanderings under the sanction of the government, not only to enlarge the boundaries of science, but to secure the interests of this country and vindicate the rights of humanity. We are well aware of the labours you underwent in your former journeyings, the privations you suffered, the perils you encountered ; and in admiring that patient endurance, that undaunted spirit, that determined perseverance of which we find in your late expedition such abundant proofs, we feel justified in entertaining the confident as well as earnest hope that, after the successful accomplishment of your new mission, you will return among us crowned with additional honours and possessing still higher claims on our gratitude and respect."

Mr. SCHOMBURGK, in reply, said :—

“ Sir,—The distinction which the Royal Geographical Society enjoys among the scientific bodies in Europe, and the lead which it has hitherto taken in the advancement of geography, must render so honourable a testimonial

as you have just now bestowed upon me a proud acquisition to any traveller, the more when he looks back to the distinguished travellers and discoverers who at former periods have received from this chair the Royal Premium. But to me it is an additional source of gratification, as it proves to the world that the researches which were carried on under the patronage and direction of this Society met with their approbation. I may perhaps be permitted briefly to recapitulate some of my labours in the West Indies. In the year 1831, I executed a survey of Anegada and its dangerous reefs, by which I trust I have been the means of saving the lives of many of my fellow-creatures, and several vessels from shipwreck. This survey brought me into connexion with the Geographical Society, and I subsequently, as is related in its Journal, explored the rivers Essequebo, Corentyne and Berbice, and investigated the capabilities of the rich and fertile colony of Guiana. One of my discoveries during this period was the *VICTORIA REGIA*, the most beautiful specimen of the Flora of the western hemisphere; and it gives me much pleasure to announce to you on this occasion, that, after three vain attempts to convey living specimens of that plant from the interior to the coast, I have just received information that five plants have arrived in good order in Georgetown, and I hope will shortly reach England. I need scarcely say that the first specimen that arrives will be placed at the disposal of Her Majesty, who has graciously permitted the beautiful flower to bear her name. My subsequent journey to Esmeralda, the details of which are in course of publication, enabled me to connect my observations with those of Baron *HUMBOLDT*, and I am proud here to

state that it was the example set by that distinguished traveller, that has led me onward through difficulties and privations of no ordinary nature, till I had the good fortune to accomplish the journey that you have been pleased this evening to crown with your approval. For myself personally, I do not feel that I have a claim to this high honour. Let me however, consider it as an encouragement to further exertion ; and although the path marked out for me at present, in my future travels in Guiana, is restricted to the limits of the colony, I confidently trust that I may obtain permission to extend them to the eastward, and also that another attempt may be made to reach the course of the Orinoco to the westward, by ascending the rivers Mocajahi and Catrimani. To you, Sir, as President of the Society, I beg to offer my sincere thanks for the too flattering terms in which you have conferred this distinction, which I shall ever consider as one of the proudest events of my life ; and I trust that my future researches may prove me to have been not wholly unworthy of it.”*

HUMBOLDT wrote a preface to the German account of the expeditions, (edited by OTTO SCHOMBURGK) in which the father of modern travellers spoke very highly of the work. The results of the journeys had afforded him, “towards the close of a very active life, the highest enjoyment.” Great had been his pleasure to witness so important an extension of the world’s geographical knowledge, and to know that such a bold, well-executed plan had been carried out by a young man with whom he felt himself connected by the bonds of a similar pursuit and a common country. “ ROBERT SCHOMBURGK had

* Geographical Journal.

in view in his examination of this part of the world, objects, which before his travels lay enveloped in obscurity. But already had he, before he set out on this expedition, given proofs of the courage with which he executed it, in a manner no less noble though different. Fighting long and manfully against all impediments and oppositions thrown in his way, he formed himself his own scientific education. That which is not to be extracted from books was furnished to him by his life in the open air, by the sight of the starry heavens in the tropical world, and by his immediate contact with living nature."

The King of Prussia decorated SCHOMBURGK with the Order of the Red Eagle, and sent him a letter in which His Majesty assured him of the great interest he had taken in his researches.

The work of the Geographical Society having been accomplished in such a satisfactory manner, our traveller was engaged as "Commissary for surveying the boundaries of British Guiana," half of the expense to be borne by the colony and the remainder by the home government. The despatch from Downing Street with information of his appointment was read in the Court of Policy on the 29th of October 1840, at a time when the relations between the planters and the government were so antagonistic, that everything emanating from Downing Street was like the proverbial "red rag" to the landed interest. The matter was ordered to be brought up with the estimates, but Governor LIGHT in a letter to Lord RUSSELL, stated his belief that the Combined Court would refuse to pay any part of the expenses of the Mission. The reply of the Secretary of State to this

letter was read to the Court of Policy on the 12th of October 1842, recommending the matter to their favourable consideration, and another despatch on December 7th, containing the following strong expression of his opinion :—

“ The item for half the expenses of the Mission for surveying and marking out the boundaries of the colony, is an item for a service not imperatively demanded by an immediate exigency, but the neglect of which might involve a large expenditure, and evils of great magnitude at a future time. The case is therefore one in which a small present sacrifice is required on grounds of prudence and foresight. The Combined Court in their eighth resolution have expressed an opinion that the service is unnecessary, and have even objected to the payments which you made towards it out of the Contingent Fund at your disposal on the Civil List. The planters of British Guiana do not perhaps consider their own interest and that of their offspring as permanently identified with the colony in which they are now following their fortunes. But it is for the well-being of the colonies themselves, that their affairs should be conducted in a more enlarged and comprehensive spirit, with a view to their permanent interests as component parts of the great Colonial Empire of Great Britain, and not with the short-sighted view of avoiding, or throwing upon the resources of the mother country, every expense which is not absolutely called for by the immediate and pressing exigencies of the day. In the present instance Her Majesty’s Government are willing to charge one moiety of the expense upon the Home Revenue, asking the colony for the other moiety only; although, as I have

observed before, if the Boundary Expedition has any other aspect than colonial, it is only because by neglecting to settle it, the mother country might at some future period be involved in the expense of a war, in addition to the continual expense of the ordinary protection of the colony and the sacrifices submitted to by the consumers in this country, for the promotion and encouragement of its staple produce.”*

Meanwhile ROBERT SCHOMBURGK had commenced the survey, assisted by Mr. GLASCOTT, and accompanied by his brother RICHARD, who had been commissioned by the Prussian Government to make collections for the Royal Museum and the Botanical Gardens at Berlin. The expedition left Georgetown on the 19th of April, 1841, and proceeded to the river Waini, from thence through the Mora Passage to the Barima, and after careful explorations of these rivers from their mouths to the sources, went to the Amacura, which was also carefully surveyed. Returning to the Waini the expedition proceeded up that river to its affluent, the Barama, and thence overland to the Cuyuni, arriving through this river at Bartica, on 27th of July.

During the three months and a half, they had travelled over 700 miles, exposed to the torrents of a rainy season; made 21 astronomical observations, and also large collections of plants and natural history specimens. RICHARD SCHOMBURGK had great difficulties in preserving the collections, but the results were on the whole very encouraging. A large quantity of living Orchids, including a very fine *Coryanthes (C. macrantha?)*, that had been entrusted to the Cap-

* Minutes of Court of Policy.

tain of a schooner unfortunately perished through nattention.

The movements of the Boundary Expedition were very jealously watched by Venezuela. From their newspapers of the time it appears that on the 13th January, 1841, the British Consul at Caracas informed the Government that Her Britannic Majesty had commissioned the Chevalier SCHOMBURGK to survey the territory of British Guiana, and to establish its limits with Venezuela; adding, that orders had been sent to the Governor of British Guiana to repel any encroachments upon territory near the borders hitherto occupied by the independant tribes. On the 28th of the same month the Venezuelan Government proposed to enter into a Boundary Treaty, by plenipotentiaries appointed by both parties. In July the Governor of Guiana communicated to his government that an English flag was flying near a sentry-box on a point at the mouth of the Amacura. A month later it was reported at Angostura that a boat and 40 men with a cannon were at the same place. To demand an explanation of these doings a Commission consisting of Messrs. RODRIGUES and ROMERO was appointed, which arrived in Georgetown on October 16th, 1841.

El Venezolano of Feb. 25th, 1842, said: "The English are now raising false pretensions to the ownership of the lands which form the margins of the Rio Orinoco, although these parts are at a distance of 60 leagues from the limits of Dutch Guiana." A great deal of agitation was felt at Caracas on account of SCHOMBURGK placing paals at the Amacura. The *Royal Gazette* of April 19th, 1842, said:—"We believe that

the conduct of the Chevalier SCHOMBURGK in taking possession of the point of land at the mouth of the Orinoco, which has caused so much distress to our Venezuelan neighbours, was wholly unauthorized, and orders have been given to remove the monuments, consisting of two or three stakes driven into the ground, which he erected upon that occasion ; so this momentous affair is likely to be settled without bloodshed."

In December 1841 the Commission, consisting of Sir ROBERT SCHOMBURGK and his brother, Mr. GOODALL an artist, and Mr. FRERE a botanist, left Georgetown for the purpose of defining and exploring the Brazilian frontier. The party proceeded direct to Pirara, from whence they journeyed to the river Takutu, tracing it to its source, where was found a black sand containing gold, but whether in sufficient quantity to pay for washing there was no time to determine. Returning to Pirara after an absence of two months, they remained there for some time to await supplies from Georgetown. In September 1842, the expedition proceeded to navigate the river Cotinga to its source near Roraima, where after an exploration of the neighbourhood the party separated, Messrs. RICHARD SCHOMBURGK, GOODALL, and FRERE, returning to Pirara, while Sir ROBERT struck across the country to the Cuyuni, returning to Georgetown in January 1843.

The views of the colonists on the expeditions were fairly represented in an article in the *Guiana Herald* of January 24th, 1843 as follows :—“ However general the opinion may be of the utter uselessness, if not inexpediency, of moot ing the question respecting the Boundary line between ours and the Brazilian Territories ; and,

however justifiable economists may deem the Legislature of this Colony were in refusing to contribute any pecuniary aid to forward the settlement of this matter, still we think there are few who will not readily admit, that entirely distinct from this question, Mr. SCHOMBURGK has rendered the most essential services to this Colony, for which, as yet, he has received no more solid compensation than some barren praise, and even that but sparingly dealt out. Not the great HUMBOLDT himself, one of the earliest traversers of the pathless wilds of the interior, has done so much to make known the resources of this vast and fertile country, or to enlighten European ignorance even upon its geographical particulars, as has recently been achieved by the exertions of the intelligent and persevering traveller now among us. And when it is recollected, that the whole annual expenses to perform these interesting and highly important discoveries and researches, only amounted to £1,100 exclusive of the salaries of the officers; and that Mr. SCHOMBURGK is now only receiving half salary, in consequence of the refusal of the local legislature to contribute a share of the expedition, we think that every well-wisher of the colony who desires to have its resources and condition made known to our brethren in Europe,—every advocate for the march of enlightenment,—and every friend of science would rejoice to see Mr. SCHOMBURGK'S just claims on the gratitude of this colony suitably acknowledged. On Mr. SCHOMBURGK'S return from his last expedition, there awaited him in Georgetown, a letter from M. JOMARD, President of the Geographical Society of Paris, intimating that the Medal of that Society had

been awarded to him for his researches in British Guiana. While foreign nations, therefore, can thus acknowledge the merit, and reward the services of this scientific man and enterprising traveller, in whose labours and researches they only profit generally, in so much as they advance the cause of literature and science, we trust it shall not be said that we, whose benefit is immediate and direct from such labours, have been less willing to reward them, either by fame or a more solid compensation."

While his brother was in Georgetown, RICHARD SCHOMBURGK was collecting on the savannahs near Pirara. His pursuits would not admit of being properly carried out during the longer expeditions, he therefore, confined himself to careful investigations of the Fauna and Flora round certain centres, the principal of which was Pirara, the others being the Pomeroon Post, and the Demerara River.

Sir ROBERT SCHOMBURGK proceeded from Georgetown, on his final expedition, on February 14th, 1843, to meet his brother and the rest of the party at Pirara. Proceeding up the Rupununi to the village of Watu Ticaba, where RICHARD SCHOMBURGK was left behind, the expedition crossed the savannahs to a small affluent of the Corentyne, where they constructed woodskins and proceeded down that river. The navigation was very difficult, the woodskins being cracked by continual collisions with the rocks. But the worst trouble was semi-starvation, the last few days of the journey being endured on an allowance of six ounces of farinha to each person per day. The party reached Georgetown on October 13th. The *Royal Gazette* of October the 19th,

thus records their return: "The Chevalier SCHOMBURGK and Mr. GOODALL, the talented artist, have, after an absence of eight months, returned safely in tolerable good health. They encountered great hardships in their descent of the Corentyne, but the objects of the expedition have been fully realised. There remains nothing now to the completion of the whole survey of Guiana, and to the accuracy of an extensive Map, than that a geometrical base line be obtained from the eastern to the western boundaries of the colony along its northern front. The necessary instruments for the purpose have been forwarded by the Admiralty, and the estimate of the expense of this is supposed to be on its way to England for the sanction of the Secretary of State."

In his account of the results of the whole of the expeditions into the interior of this country, the sum total is almost wonderful. From the various maps accompanying the reports in the Geographical Journal, it may be best seen how the blanks were gradually filled up by one exploration after another, until the final Map left very little to be discovered. The latitudes of 174 different points were determined by 4,824 altitudes of heavenly bodies, while other meteorological investigations were carried on wherever circumstances permitted. Notwithstanding serious losses his collections were enormous, besides supplying private subscribers, he contributed to the British Museum, 2,500 specimens of plants, 100 of woods, a number of seeds and fruits, a flower and leaf of Victoria Regia, a collection of bird's skins, 100 specimens of fishes, a geological collection, and an ethnological collection. To the Royal College of Surgeons were presented,

an Indian skeleton, some skulls, and plaster casts of faces ; to the Model-room of the Admiralty, 106 specimens of woods ; and to Kew a number of living plants including several new orchids. His writings consisted principally of the Journals of the expeditions ; he had no time to study his collections and elaborate the results, but there were others ready to investigate the specimens, and publish them in the scientific periodicals of the time.

While residing in Georgetown up to the time of his departure, Sir ROBERT SCHOMBURGK took great interest in the formation of the Agricultural and Commercial Society, of which he was elected a honorary member on the 1st of May. In acknowledging the letter in which he had been informed of his election, he assured the " Society" that he would always take the liveliest interest in their Institution, which promised to be of great advantage to a colony, of the greatness and the variety of natural resources of which, he had the most indubitable proofs during his researches in the interior. He had fitted up an Observatory at Eve Leary, where he carried on his Astronomical work up to the time of his departure on the 20th of May 1844. On the last day of the same month the instruments used in the boundary survey were presented by the Governor to the new Astronomical and Meteorological Society, of which Dr. BONYUN was one of the principal promoters. An Observatory was to be erected in the Parade Ground and a great deal of enthusiasm was shown by some of the members. In April a correspondence had been initiated in the *Royal Gazette* by a paper of SCHOMBURGK on the Mudar (*Calotropis gigantea*) as a remedy for Leprosy, followed by a letter advocating the establishment of a Botanical Garden. In

the first occurs the following passage, which is interesting as showing the traveller's idea of the purposes for which such a garden could be utilized :—

“ At this period, when the greatest efforts is being made to institute a Society for the advancement of the Agricultural and Commercial interests of British Guiana, and where one of the manifold objects, it is to embrace, consists of a Museum where the best specimens which can be obtained, of the productions of the colony, both indigenous and introduced, shall be kept, it is not amiss to point out how desirable and honourable to the colony it would be, to possess a Botanical Garden for the cultivation of such of our indigenous plants which are either useful for general purposes, or which according to previous knowledge, or the information of our native Indians, or the populace at large, are used in diseases or considered to possess medical virtues.” In a reference to another letter of SCHOMBURGK'S, the Editor of *Royal Gazette* said, that his accomplished correspondent wished to urge on the inhabitants, generally, and the new Agricultural Society in particular, the formation of a Botanical Garden in the vicinity of the town, for which he advanced four arguments, each of which singly ought to be enough to carry the day for him. “ First, a Botanical Garden would promote medical science ; second, it would be an honour and ornament to the country and town ; third, it would afford healthy and innocent recreation to the poor ; fourth, it would *désennuyer* the rich by giving them a new amusement. SCHOMBURGK'S letters led to further correspondence ; “ *Erinensis*” took up the cudgels for Astronomy and the new Astronomical Society, which was answered in a good-humoured way by the

traveller, who told his antagonist to pity him for his amiable enthusiasm for botany. Another correspondent, "Guyannensis," took SCHOMBURGK'S side, while a looker-on poked fun at the whole correspondence in a letter dated Isle of Sky, and signed "Potatoe Aldebaran," giving a humourous account of the conflict between the "Plants and the Stars."

After leaving British Guiana, SCHOMBURGK remained in Barbados for some time, collecting materials for his history of that island, which was published in 1847. In the following year he was appointed British Consul at St. Domingo, whence in 1852 he forwarded to the Royal Agricultural and Commercial Society a letter on the Ramon Tree (*Trophis Americana*), which he recommended to be grown in Guiana on account of the young leaves being useful as fodder. In 1857, he was sent to Siam as Her Majesty's Consul General, where he was enabled to advance the interests of British Commerce, and to make several geographical surveys. His health declining, he returned to England in the autumn of 1864, and retired on a pension, and after enjoying this for only a few months in his native country, he died at Berlin on the 11th of March, 1865. RICHARD SCHOMBURGK is still living and is now 78 years of age. After publishing the "Reisen" in 1847, he became implicated in the trouble of the German Revolution of the following year, to escape which he emigrated to Australia, where he became a farmer and winegrower. In 1865 he accepted the post of Director of the Adelaide Botanical Gardens, which he still holds.

The following is a list of the principal books and articles written by Sir ROBERT SCHOMBURGK and his

brother, together with the various descriptions by other writers of the specimens collected during their explorations in the interior of this country :—

1835. G. BENTHAM.—Enumeration of the Plants collected by Mr. SCHOMBURGK in British Guiana. Annals Nat. Hist., Vol. II.

1836. ROBT. H. SCHOMBURGK.—Report of an Expedition into the Interior of British Guyana in 1835-6. Geographical Journal.

— On the Religious Traditions of the Macusi Indians, who inhabit the Upper Mahu and a portion of the Pacaraima Mountains. Read before Soc. Antiq., Nov. 17.

1837. — Papers read before the Botanical Society of London: On *Victoria Regia*; on *Loranthus Smythii*. Proceedings Bot. Soc., London.

— Diary of an Ascent of the River Corentyn in British Guiana in October, 1836.—Diary of an Ascent of the river Berbice in British Guiana in 1836-7. Geograph. Journal.

— Chart of the Mouth of the river Corentyn. Admiralty Office.

— J. LINDLEY.—Monograph of *Victoria*, folio, plates.

1838. ROBERT H. SCHOMBURGK.—Papers read before the Botanical Society: On *Triplaris Americana*; on *Bertholletia excelsa*. Transactions Bot. Soc. Lond.

— G. BENTHAM.—Observations on some Genera of Plants connected with the Flora of Guiana. Linn. Soc. Trans., Vol. XVIII.

1839. ROBT. H. SCHOMBURGK.—Description of the Mora tree, (*Mora excelsa*). Linnean Transactions, Vol. XVIII.

— Narrative of his recent Botanical Expedition in Guiana. Annals Nat. Hist., Vol. IV.

— Report of the Third Expedition into the interior of Guiana, comprising the Journey to the Sources of the Essequibo, to the Caruma Mountains and to Fort San Joaquin, on the Rio Branco, in 1837-8. Journey from Fort San Joaquin on the Rio Branco, to Roraima, and thence by the Rivers Parima and Merewari to Esmeralda on the Orinoco, in 1838-9. Journey from Esmeralda on the Orinoco to San Carlos and Moura on the Rio Negro, and thence by Fort San Joaquin to Demerara, in the Spring of 1839 Geogr. Jour. (Published separately under the title "Researches in Guayana, in 1837-9.")

1840. ROBT. H. SCHOMBURGK.—A description of British Guiana, Geographical and Statistical: Exhibiting its Resources and Capabilities, together with the present and future condition and prospects of the Colony. London, 8vo.

— Natural History of Fishes of Guiana, Memoir and Introduction. JARDINE's Naturalists' Library, London, 2 Vols., 12 mo., Coloured Plates.

— Views in the Interior of Guiana, London, Imp. folio, Coloured Plates.

— NEES VON ESENBECK.—*Cyperaceæ a Schomburgkio in Guiana Anglicæ collectæ, ex Herbario Lindleyano.* HOOKER's Jour. Bot., Vol. II.

— G. BENTHAM.—On the *Heliamphora nutans*, a new Pitcher plant from British Guiana. Linn. Soc. Transact., Vol. XVIII.

— Contributions towards a Flora of South America.—Enumeration of Plants, collected by Mr. SCHOMBURGK in British Guiana. HOOKER's Jour. Bot. Vol. II.

— Parliamentary Papers relative to British Guiana, ordered to be printed 11th May, 1840.

1841. ROBERT HERMANN SCHOMBURGK'S Reisen in Guiana und am Orinoko während der Jahre 1835-1839. Nach seinen berichten und Mittheilungen an die Geographische Gessellschaft in London, Herausgegeben von O. A. SCHOMBURGK. Mit einem Vorwort von ALEXANDER VON HUMBOLDT und dessen abhandlung über einige wichtige, Astronomische Positionen Guiana's. Leipzig, 8vo, Map and Coloured Plates.

— G. BENTHAM.—Contributions towards a Flora of South America.—Enumeration of Plants collected by Mr. SCHOMBURGK in Guiana. HOOKER's Jour. Bot., Vol. III.

1842. ROBT. H. SCHOMBURGK.—Expedition to the Lower Parts of the Barima and Guiana Rivers, in British Guiana. By the Chevalier R. H. SCHOMBURGK. (Communicated by the Colonial Office)—Excursion up the Barima and Cuyuni Rivers, in British Guiana in 1841. Geographical Journal.

— G. BENTHAM.—Contributions towards a Flora of South America.—Enumeration of Plants collected by Mr. SCHOMBURGK in British Guiana. HOOKER's Jour. Bot., Vol. IV. Continuation in Lond. Jour. Bot., Vol. I.

1843. ROBT. H. SCHOMBURGK.—Visit to the Sources of the Takutu in British Guiana, in the year 1842. Communicated by the Colonial Office. Geographical Journal.

1843. ROBT. H. SCHOMBURGK.—Loose Notes from the Journal of the Chevalier SCHOMBURGK. Guiana Herald, Feb. 7th and 9th.

— G. BENTHAM.—Contributions towards a Flora of South America.—Enumeration of Plants collected by Mr. SCHOMBURGK in British Guiana. London, Jour. Bot., Vol. II.

1844. ROBT. H. SCHOMBURGK.—Description of a new species of *Calycophyllum* from British Guiana.—On two new species of the Family Laurineæ from the Forests of Guiana (*Nectandra Rodiei* and *Acrodielidium Camara*.) HOOKER's Lond. Jour. Bot., Vol. III.

— — — — — Remarks on the Geology of British Guiana. Read before the Geological Society, Dec. 4.

— — — — — The Mudar or Ericu (*Calotropis gigantea*.) Dem. Royal Gazette, Feb. 24.

1845. ROBT. H. SCHOMBURGK.—Journal of an Expedition from Pirara to the Upper Corentyne, and from thence to Demerara, executed by order of Her Majesty's Government, and under the Command of Mr. (Now Sir) ROBT. H. SCHOMBURGK, K.R.E., Ph.D., &c., &c. Geographical Journal.

— — — — — Description of the Murichi or Ita Palm of Guiana. Read before Brit. Assoc. at Cambridge, June 20.

— — — — — Characters of two new Plants discovered in British Guiana by the Chevalier R. H. SCHOMBURGK. (*Alexandra Imperatrix* and *Barbacenia Alexandrinæ*)—A description of *Ophiocaryon paradoxum*, or the Snake Nut of Guiana. HOOKER's Lond. Jour. Bot., Vol. IV.

— G. BENTHAM.—Contributions towards a Flora of South America. Enumeration of Plants collected by Sir ROBERT SCHOMBURGK in British Guiana, London Jour. Bot., Vol. IV.

1846. G. BENTHAM.—Contributions towards a Flora of South America. Enumeration of Plants collected by Sir ROBERT SCHOMBURGK in British Guiana. London Jour. Bot., Vol. V.

1847. RICHD. SCHOMBURGK.—Reisen in Britisch-Guiana in den Jahren 1840-1844 im Auftrag Sr. Majestät des Königs von Preussen, ausgeführt von RICHARD SCHOMBURGK. Nebst einer Fauna und Flora Guiana's nach Vorlagen von JOHANNES MULLER, EHRENBURG, ERICHSON, KLOTZSCH, TROSCHEL, und andern. Mit Abbildungen und einer Karte von British-Guiana aufgenommen von Sir ROBERT SCHOMBURGK. Leipzig, 3 Vols. 8vo.

1847. ROBT. H. SCHOMBURGK.—Description of some grasses and sedges from the East Coast of Demerara, with remarks on the Geographical distribution of the species. *Annals Nat. Hist.*, Vol. XX.

1848. ROBT. H. SCHOMBURGK.—Sir WALTER RALEIGH's Discovery of the large, rich and beautiful Empire of Guiana, with a relation of the great and golden city of Manoa (which the Spaniards call El Dorado), etc., performed in 1595 ; reprinted from the edition of 1596, with some unpublished documents relative to that country ; edited, with Notes and a Biographical Memoir by Sir R. H. SCHOMBURGK, Map, 8vo., HAKLUYT Society's Publications, Vol. III.

— G. BENTHAM.—Contributions to the Flora of Guiana. Enumeration of Plants collected in Guiana by Sir ROBERT and RICHARD SCHOMBURGK and others, London, *Jour. Bot.*, Vol. VII.

1851. ROBT. H. SCHOMBURGK.—On the Forest Trees of British Guiana, and their uses in Naval and Civil Architecture. Read before the Linnean Society, Dec. 16.

— Sir W. J. HOOKER.—*Victoria Regia*, or Illustrations of the Royal Water Lily, in a series of Figures chiefly made from specimens flowering at Syon House and Kew, by WALTER FITCH, London, Imp. Folio, Coloured Plates.

1854. G. BENTHAM.—Notes on North Brazilian Gentianeæ, from the collections of Mr. SPRUCE and Sir ROBERT SCHOMBURGK. HOOKER'S *Jour. Bot.*, Vol. VI.

1876. RICHD. SCHOMBURGK.—Botanical Reminiscences in British Guiana. *Adelaide*, 8vo.

Opening up the Country.

By F. E. Tinne.

 HIS stereotyped phrase is so loosely applied to every conceivable scheme or measure which any one individual calculates to be for the advantage of himself and his class, that it becomes seriously worth our while to decide what is a useful development and what on the other hand is the telescopic operation of opening out, previous to shutting up, our existing stability and resources.

Easy access to fertile land, steady markets for our produce at home and abroad, judicious attempts to render our whole population more dependent on their own industry and prudence instead of pauperising their mind and body by a pseudophilanthropic government, the discovery of new products and new industries from our almost unknown wealth in land and forest, and the introduction of new scientific and mechanical appliances, all these may justly be included in the phrase opening up the country ; but side by side with this we must remember that there is a too fatal facility in over-rapidly borrowing money for these purposes, often followed by an overwhelming burden of public debt, which may cripple current finance and established interests.

Since 1884, the great peril which threatened cane sugar, in the enormous increase of bounty-fed beetroot sugar, has almost passed away. The ability of Baron DE WORMS, backed by the generous support of British

working-men (cosmopolitan in their sympathy for genuine free trade), has brought within measurable distance the abolition of the bounty system ; and it is hardly too much to say that with improved extraction and evaporation and less building labour, Demerara planters bid fair to show a steady return upon their investments, whilst many of the Continental Usines are as shaky as the Panama Canal. It appears scarcely credible, and yet the fact remains, that cane sugar for direct consumption at 17/- and 18/- pays better to-day than it did ten years ago at 23/- to 25/-.

In distilling we have much leeway to make up ; our returns are not generally satisfactory ; and so long as France and Germany compete in giving high bounties on spirits, it will possibly pay us better meanwhile to sell our molasses and improve our knowledge for future application.

Our next great export is that of greenheart timber,* and here it is not the want of trees, but the want of a clear waterway that hinders the industry. If the Government will introduce regulations to render the import and storage of dynamite and other explosives more easy, the rapids which now impede the passage of rafts could be removed ; and not only the timber trade, but gold mining also, would receive a fresh impulse.

Rice already receives substantial protection to the extent of 25c. per 100 lbs., and shows symptoms of becoming an established industry here. There is no possible reason why eventually this colony should not

* A word of recognition should here be given to the fact that gold, not timber, is, at present, our next great export, after sugar and the allied products, molasses and rum.—ED.

produce its own requirements instead of sending to India over £100,000 per annum for an inferior article and paying freight to bring it here. Cocoa cultivation is steadily gaining ground ; and it is said by some that in the " wild cocoa" (a totally different plant) which thrives on the banks of all our rivers, we have a stimulant beverage from the parched beans as good as cocoa proper.

Efforts to establish a fruit export trade are being made by Capt. WHITE, and his friends in the United States. No country can grow better bananas, oranges, and limes ; nowhere are mangoes so cheap ; and placed within reach of the buyer, a market may be developed which would in a short time bring employment to many a man of small means in the colony.

This leads one on to speak of internal means of communication by road, river, and sea ; and here it is necessary to act with caution and yet with liberality. The available land for settlement is already large but access to it is uncertain ; and nowhere in the world is combined action more necessary or more difficult for small settlers, as regards drainage, water-supply, and sea defences, than in this extensive mud-flat of British Guiana, with its land four feet below high spring tides, its very capricious rainfall of 70 to 100 inches, and its lazy but pleasant climate.

No man in his sober senses would seek *de novo* to construct the present railway from Georgetown to Mahaica, where a steam canal would so much better have fulfilled all the requirements of the situation ; yet whilst twenty years ago Mr. CATHER, an Engineer, was blamed for his extravagance in proposing to continue the line to Berbice, with its existing gauge

and rolling stock for the sum of £140,000, ten years later our late Attorney-General in concert with an American contractor, Mr. MACKAY, nearly succeeded in spending £300,000 for an entirely new line from Mahaica to New Amsterdam, which would have created a void in our colonial revenue for many years to come.

It would be considerably more profitable to run a tramway or an inland canal behind the West Coast of Demerara, where the increasing disasters on the stone dams to sea punts and the busy aspect of the highway, suggest the likelihood of dividends to the private investor, who reflects that here all the estates' buildings are nearly in a line instead of being at vastly different distances from the sea, as on the East Coast.

But if we object to these costly land-lines, that is no reason why by water much may not be done to improve our means of intercourse with outlying parts and the metropolis.

The Settlement steamer might easily call twice a week at a stelling at Parica ; a boat of similar size calling twice a week in the Barima, Moruca, and Waini Rivers might render more prosperous and populated that already thriving district ; and a canal of no great length, with locks between the Hayama and Macouria creeks, would bring Massaruni and its stone quarries within easy reach of town by river punts.

For the great objects of sea-defence, water-supply, and drainage, much has been done by Government assistance and much by private enterprise, no single man having contributed so much patient and modest labour in this direction as the late Mr. WILLIAM RUSSELL, whose efforts in the Lamaha, Boerasirie, East Coast Demerara,

and Canje water schemes, have rendered his name imperishable. In nearly all these instances the first outlay is so heavy that Government loans are peremptorily needed to enable the work to be undertaken, and the greatest care is necessary to expend the money with economy, or insufficient revenue from the outlay and consequent loss to the general exchequer may arise. It is just as great a mistake to expend money upon impossible education schemes or colony roads, which no man of independent judgment ever expected the authorities could recover, as to spend it for a laudable object, but in a lavish and extravagant manner, upon ventures like the Canals Polder, where works of an exceedingly solid character, but undue cost, will serve as monuments to remind the general taxpayer of how he was bled to gratify the vanity of an official, or to benefit some special section of the community, at the cost of the public revenue.

To concentrate our population in the most favoured spots, and to extend the radius of civilisation with the utmost caution, is the duty of our rulers : to induce settlement instead of migration to and from foreign lands ; and to encourage local industry and thrift by prudent adjustment of tariff and internal taxation. All these objects will be attained if we open out our adopted country in a way that shall bring us in touch with the outward world of commerce and knowledge, and lead them to regard us once more, and deservedly, as the El Dorado that Sir WALTER RALEIGH once called our land.

Rocks and Minerals of British Guiana.

*Being a Catalogue of the Specimens in the British Guiana Museum,
collected, named, and arranged by Charles Barrington Brown
late Geological Surveyor of the Colony.*

HE present article forms the first instalment of the Museum Catalogue which it is intended to publish serially in "Timehri," until it becomes possible, by a completion of the identification of various specimens and their better classification and arrangement, to publish a catalogue in full.

The classified list was prepared, nearly in its present form, by Mr. BROWN, soon after the Survey of the colony was finished; and as the collection of rocks and minerals contains illustrative specimens from all the various parts of the colony examined, it forms a most valuable series in connection with the "Reports on the Geology of British Guiana" prepared for the Government by Messrs. SAWKINS and BROWN, the Geological Surveyors.

In these reports, the various rocks and minerals of the colony have been classified into four chief groups, chronologically:—

- I.—The alluvial or post-pliocene deposits.
- II.—The sandstone formation.
- III.—The metamorphic rocks.
- IV.—The granitic rocks.

The alluvial deposits consist of a recent alluvium in swampy districts and bordering small streams all over the colony, apparently of a very productive nature; of

the fluvio-marine or coast deposit; of river loam along the courses of the rivers, and beyond the coast deposit; and of the valley gravel and the sand and clay deposit.

Of these the coast deposit is the most important, since here are established the various plantations of the great industry of the colony. It extends along the whole sea-board, a few feet below the level of spring tides, inwards to a varying width of from 5 to 35 miles, where it attains a height of about 12 feet. Its depth is about 100 feet, and it consists of varying layers of fine sand and bluish clay, with portions of decayed vegetable matter. The surface soil of this deposit consists of a fertile dark-coloured loam on the estates; and beyond them, of a dark earth made up largely of decayed vegetable remains. Many of the clay beds of this deposit are suitable for brick-making, while the bluish-clay below the soil, when burnt, is applied for the purposes of road-making.

The valley gravel on the great savannahs, and the sand and clay deposit which underlies the coast deposit at a depth of about 100 feet near the shore, are to be regarded as most probably equivalents of each other. The sand and clay deposit extends inland from the boundary of the coast deposit, and forms a tract averaging from 60 to 150 feet in height. The white sand of this deposit, which is very abundant, is generally very pure and well adapted for glass-making, while the white clay, especially that obtainable at Oreala on the Corentyne river, seems very suitable for the manufacture of porcelain and earthenware. Impure oxides of iron are widely and variously distributed in beds in the alluvia deposits.

The sandstone formation constitutes a large part of the Pacaraima Mountains, and crosses all the chief river systems of the colony. It consists of beds of coarse conglomerate, red and white sandstone, and red shale; and interbedded with these, the plutonic rock, greenstone, generally occurs, partly contemporaneous and partly intrusive; and at their planes of contact the sandstone usually exhibits considerable alteration. Thin beds of fine red jasper, suitable for inlaid work, also occur in some of the layers of this formation.

No fossils have hitherto been found in this sandstone, so that its geological classification can scarcely be considered as settled; but it seems almost certainly to be an equivalent of the New Red Sandstone. The most distinctive of the natural features of the colony, are found in connection with the various conditions of this formation; and denudation of a most active kind has been at work during vast ages to produce conformations as strange as they are magnificent, instanced best in those extreme examples, the perpendicular mountain, Roraima, on the inner confines of the colony, and the unique Kaieteur waterfall on the Potaro.

The greenstone consists chiefly of a coarse variety of diorite, but its texture and its mineral character are more or less varied in different places. This rock occurs either in continuous layers over a large extent of country, or as isolated hills evidently formed by denudation, or as extensive dykes piercing through granite, gneiss, quartz-porphyry and sandstone, over the whole surface of the colony, and more especially noticeable along the river courses in the dry seasons. Igneous action must have been, at the date of eruption, extremely

active and widespread; and it may be that the absence of fossils from the sedimentary formations is due to this cause. The practical purposes to which the sandstone and greenstone might be applied, such as building and paving in the former case and road-making, for which the latter is particularly adapted, are negatived by the fact that the distance and the difficulty of transport across the rapids of the rivers, would be out of all proportion to the value of the rocks. Masses of ores of iron, often of considerable size, and small quantities of manganese ore, are found on, or are associated with, the greenstone rocks.

The metamorphic rocks include the various schists (such as mica, hornblende, quartz, talc, and chlorite schists), the nests and veins of quartz contained in these schists, and gneiss, with which the schists are associated in many localities, and of which a very large portion of the colony is composed. The gneiss rests chiefly on granite, and is often granitic, so much so that in small hand specimens it would be almost impossible to determine the difference; and in fewer cases it becomes even porphyritic. Garnet crystals and quartz nests are very widely distributed throughout this rock, and an impure graphite (plumbago) has been found to occur in the Carabung and the Barima rivers in the schistose rocks. The special importance of these rocks, however, from an economic standpoint, lies in the fact that gold is widely distributed among them; and more systematic search is gradually bringing to light the still more interesting fact that it is not only widely, but plentifully, distributed.

The granitic rocks include quartz-porphyry and felstone, and granite proper and syenite. The two former

are found over the surface of the granite in considerable layers, and underlying the gneiss. The composition of the rocks of this group is very variable, the quartz-porphyry passing into granite on the one hand, and into porphyritic felstone and true felstone on the other. Iron-pyrites often occur in association with them.

Granite is of very common occurrence as a surface rock throughout the interior of the colony; and it lies at the base of all the rocks of the country. Its texture, colour, and composition are extremely variable, and in many parts the quartz ranges from the transparent and white varieties to a beautiful opalaceous variety. It is very largely quarried for road-making; but, as ornamental stones, the members of this group of rocks are particularly suitable, more especially the granites with opalaceous quartz.

Such, in the main, may be advanced as a very brief recapitulation of some of the chief and more generally interesting and useful matter, bearing on the rocks and minerals, to be found in these valuable reports—reports, however, which, on account of the extreme difficulty of the investigations made, sadly require extension in order to place the colony under the class of districts to be considered as geologically known. Persons specially interested in the subject should consult the reports for themselves.

Within the last two or three years considerable attention has been given to the search for gold, and the metal has become, as judged by its export value, the basis of the second industry of the colony—an export second only to the products of the sugar industry, sugar, rum, and molasses—and if the advance that has been so far made in the

present year be progressively maintained, the industry bids fair to be a powerful lever in the opening up of the interior of the country.

The search for gold has also brought to light the fact that *diamonds* are to be found in the colony ; and a sample of one of these, forwarded to Europe by Mr. GEORGE GARNETT to be cut and polished, was pronounced to be of good "water," though, being of small size, practically valueless. Still the fact of the occurrence of these precious stones in the colony, is interesting and suggestive.

Another mineral to be added to the colony list, is *Catlinite*, a variety of pipe-stone, specimens of which were obtained by Mr. IM THURN from the Indians of Konkarno. This mineral is composed chiefly of a mixture of hydrated silicates of aluminium, magnesium, lime, iron, and manganese.

The knowledge that we at present have of the rocks and minerals of the colony, must be regarded as but the firstfruits of research, for the gradual development of the country, with its detailed surveys of the vast forests and savannahs, now lying useless and unexplored, cannot but be the means of considerably extending it.—ED.

I.—POST-PLIOCENE FORMATIONS.

NO.	DESCRIPTION.	LOCALITY.
1	White clay	Demerara river.
2	Pinkish " " "	" "
3	Hydro-oxide of iron and clay	" "
4	" " "	Pirara savannah.
5	" " "	Carabung river.
6	" " "	Woka mountain, Cuyuni river.
7	" " "	Pirara.

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NO.	DESCRIPTION.	LOCALITY.
8	Hydro-oxide of iron and clay	Siparuni river.
9	" " "	Rupununi river.
10	Quartz sand cemented by oxide of iron	Quitaro river.
11	" " "	Demerara river.
12	" " "	Anourime inlet, Rupununi river.
13-14	Hydro-oxide of iron ...	Supinaam river.
15	" " ...	Woka mountain, Cuyuni river.
16	Sand cemented by oxide of iron ...	Quitaro river.
17	Oxide of Manganese ...	Between Barima and Barama river.
18	Hydro-oxide of iron ...	Wahmara mountain, Upper Demerara river.
19	Pisolitic hydro-oxide of iron	" "
20	Sand and oxide of iron ...	" "
21	Sand cemented by oxide of iron ...	Etunie, Berbice river.
22	Recent conglomerate ...	Upper Demerara river.
23	Ironstone pebble, with polished coating ...	" "
24	White clay (Kaolin) ...	Wickie, Berbice river.
25	" stained by oxide of iron ...	" "
26-27	White clay (Kaolin) ...	Orealia, Corentyne river.
28	Sand cemented by white clay	" "
29	" impregnated with black vegetable matter ...	Siparuta, "
30	Coarse angular pebble in clay ...	" "
31	Salt earth ...	Chewow river, Ireng savannah.

II.—SANDSTONE FORMATION.

32	Argillaceous sandstone ...	Karakanang, Pacaraima mounds.
33	Sandstone ...	Yacali river.

NO.	DESCRIPTION.	LOCALITY.
34-35	Sandstone	... Curibiru cataract, Essequibo river.
36-42	"	... Near Karakanang, Pacaraima mountains.
43-44	"	... Peepee river, "
45	"	... North of Cumararing mountains.
46-47	"	... Itababo island, Essequibo river.
48-49	"	... Below Marlissa rapid, Berbice river.
50	"	... Mouth of Rewa river.
51	"	... Ekilebah valley, Ireng river.
52-53	"	... Arnick valley, Upper Potaro river.
54	"	... Taiepong savannah.
55	"	... Takutu rapid, Siparuni river.
56	"	... Kaieteur fall, Potaro river.
57	"	... Aruwai fall, Mazaruni river.
58-59	"	... Maccari mountain, Essequibo river.
60	"	... Cabalebo mouth, Corentyne river.
61-62	"	... Itabru mountain, Berbice river.
63-64	"	... Base of Twasinki mountain, Essequibo river.
65-66	"	... Amailah fall, Curiebrong river.
67-68	"	... Below Akalikatabo island, Corentyne river.
69-70	"	... At Akalikatabo island, Corentyne river.
71	" altered by contact with greenstone	... Woosouter cataract, Upper Mazaruni river.
72	"	... Head of Mazaruni river.
73	Sandstone exhibiting filled up sun cracks	... Amailah fall, Curiebrong river.

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NO.	DESCRIPTION.	LOCALITY.
74-76	Red shale	Near Encaco village.
77	Jasper from Sandstone beds	Curibiru cataract, Essequibo river.
78-80	"	Karakanang, Pacaraima mountains.
81	Greenish cherty rock in beds	Near Waetipu mountains.
82	Conglomerate ...	Itabru mountain, Berbice river.
83-84	" ...	Carabung river.
85	" ...	Sacaouta, Pacaraima mountains
86-87	" ...	Maccari mountain, Essequibo river.
88	" ...	Kaieteur fall, Potaro river.
89	Altered conglomerate	Below Marlissa rapid, Berbice
90	" "	Marakang river, Pacaraima mountains.
91	Junction of sandstone and greenstone	Cumuti mountains, Essequibo river.
92	Greenstone (Diorite)	Mountain top, above Emoy river.
93	" ...	Roraima mountain.
94	" ...	Pacaraima mountains.
95-96	" ...	Tumatumari cataract, Potaro river.
97	" ...	Upper Essequibo river.
98	" ...	Demerara river.
99-101	" ...	Cumuti mountain, Essequibo river.
102	" ...	Siparuni river.
103	" ...	Upper Essequibo river.
104	" ...	" Rupununi river.
105	" ...	Potaro river.
106	" ...	Mattapi, Corentyne river.
107	" ...	Rupununi river.
108	" ...	Cuyuni river.
109	" ...	Pacaraima mountains.
110	" ...	Upper Essequibo river.
111	" ..	" Rupununi river.
112	" ...	Cuyuni river.

NO.	DESCRIPTION.	LOCALITY.
113	Greenstone (Diorite)	... Cuyuni river.
114	"	... Mazaruni river.
115	"	... Near Enamouta.
116	"	... Quitaro river.
117	"	... " savannah, near Shea.
118	"	... Siparuni river.
119	"	... Upper Essequibo river.
120	"	... Near Peaimah fall.
121	"	... Below "
122	"	... New river.
123	"	... Cuyuni river.
124-125	"	... Mazaruni river.
126	"	... Woosouter cataract, Mazaruni river.
127	"	... Siparuni river.
128	"	... Near Manarie, Barima river.
129	"	... Cuyuni river.
130	"	... Below Cobanatout cataract, Potaro river.
131	" with iron pyrites	... Mazaruni river.
132	" with chlorite	" "
133	Fine grained greenstone	... Potaro river.
134	"	... Demerara river.
135	"	... Rupununi river.
136	"	... Mazaruni river.
137	"	... Cuyuni river.
138	"	... Mount Istua, near Pomeroon river.
139	"	... Siparuni river.
140-141	Vesicular diabase	... Rewa river.
142	Compact greenstone	... Curua rapid, Rupununi river.
143-144	Amygdaloidal greenstone containing kernels of natrolite, glauconite and calc spar	" "
145	Porphyritic greenstone	... Warrutu cataract, " Potaro river.

NO.	DESCRIPTION.	LOCALITY.
146	Porphyritic greenstone	... Pacoutout cataract, Potaro river.
147	"	... Near Carabung mouth, Mazaruni river.
148	Coarse diorite ...	... Above Turisi cataract, Mazaruni river.
149-150	" ...	... Near Teboco cataract, Mazaruni river.
151	Porphyritic greenstone	... Curuni river, Corentyne river.
152	Amygdaloidal "	... Above Paumbo island, Essequibo river.
153	Botryoidal haematite in cavities, in greenstone	... Roraima mountain.
154	Natrolite from cavities in greenstone ...	... Curua rapid, Rupununi river.

III.—METAMORPHIC FORMATIONS.

155	Decomposing mica schist	Warrerie, Cuyuni river.
156	Mica schist ...	... Totohwow river, Carawaimentow mountain.
157-158	" ...	... Barama river.
159-162	" ...	... Carabung river.
163	Talc schist ...	... Cuyuni river.
164	" ...	... Puruni river.
165	Mica schist ...	... Curiebrong river.
166-167	" ...	... Near Peaimah fall.
168	" ...	... Barama river.
169-170	Chlorite schist ...	... Issano river, Mazaruni river.
171-172	" ...	... Cuyuni river.
173	" ...	... Barama river.
174-176	Hornblende schist	... Curuni river, Corentyne river.
177	"	... Itaburro river, Upper Demerara river.
178	"	... Mazaruni river.
179	Micaceous iron schist	... Barama river.
180-181	" "	... Carawaimentow mountain.
182	Quartz schist ...	... Barama river.
183	" ...	... Upper Essequibo river.

NO.	DESCRIPTION.	LOCALITY.
184	Quartz schist ...	... Aramatan river, Corentyne river.
185	„ „ „	Cuyuni river.
186	„ „ „	Curuni river, Corentyne river.
187	Decomposing mica schist	Curiebrong river.
188	Plumbago from schist	Manicuru river, Barima river.
189	Manganese in slaty rock	Beyond Weyamou, Mazaruni river.
190-192	Quartz containing gold	Warrerie, Cuyuni river.
193	Quartz vein	Curiebrong river.
194	„ „ „	Near Issano, Mazaruni river.
195-201	„ „ „	Cuyuni river.
202-203	„ from quartz porphyry	Between Mora and Ireng river.
204	„ „ „	Mazaruni river.
205-205	Quartz veins	... Pacaraima mountains.
207	„ „ „	Demerara river.
208	„ (bluish)	Cuyuni river.
209	„ „ „	Barama river.
210	„ (rusty)	„
211-212	Quartz	Annai mountain, Rupununi river.
213	„ „ „	Pomeroon river.
214	„ „ „	Manarie.
215	„ „ „	Barama river.
216	„ „ „	Rewa river.
217	„ „ „	Amutu fall, Potaro river.
218-220	„ „ „	Quitaro river, savannah.
221-222	„ „ „	Anourime inlet, Rupununi river.
223-224	Opalaceous quartz	Achramucra, Essequibo river.
225-227	„ „ „	Quitaro river, savannah, near Shea.
228	Quartz, with schorl crystals	„ „
229	„ „ iron pellets	„ „
230	Quartz crystals...	Near Karakanang, Pacaraima mountains.

NO.	DESCRIPTION.	LOCALITY.
231	Quartz crystals from drusy cavity	... ... Takutu river.
232	Gneiss, with granite vein	Waini river, cataract.
233-235	" "	" Barama river.
236-237	" "	" Cuyuni river.
238	" "	" Mazaruni river.
239-240	" "	" Dowacaima cataract, Barama river.
241	" "	" Rewa river.
242-245	" "	" Upper Essequibo river.
246-251	" "	" Quitaro river.
252-253	" "	" Rewa river.
254-255	" with garnets	Quitaro river.
256-258	" "	" Upper Essequibo river.
259	" "	" Barama river.
260-263	" "	" Upper Essequibo river.
264	" "	" Rewa river.
265	" "	" New river, Corentyne.
266-271	" "	" Above King Fred. Wm. IV. cataract, Corentyne river.
272	" "	Curuni river, Corentyne river.
273	" (porphyritic)...	Demerara river.
274	" "	Quitaro river.
275-276	" "	Near Suwaraowra river, Takutu savannah.
277-278	Decomposing gneiss	... Warrerie, Cuyuni river.
279	" "	Carabung.
280	Quartzose rock in gneiss	Upper Essequibo river.
281	Pitchstone	" ... "
282-283	Gneiss with garnets	" "

IV.—GRANITE AND GRANITIC ROCKS.

284	Partially decomposed quartz-porphyry	... ...
285	" "	... ...	Siparuni river.
286	" "	... ...	Takutu, Siparuni river.
287	" "	... ...	Itabru mountain, Berbice river.

NO.	DESCRIPTION.	LOCALITY.
288	Quartz-porphyry	... Ouropocari cataract, Esse quebo river.
289-296	"	... Pacaraima mountains.
297-299	"	... Siparuni river.
300	"	... Ouropocari cataract, Esse quebo river.
301	"	... Maikong-pati, Cotinga river.
302-304	"	... Siparuni river.
305-306	"	... Cassikitu rapid, Upper Esse quebo river.
307	"	... Below Christmas cataract, Berbice river.
308-309	"	... Near Siparuni mouth.
310	"	... Maccari mountain, Essequibo river.
311	"	... Annai mountain, Rupununi river.
312	"	... Mora, Rupununi river.
313	"	... Siparuni river.
314	"	... Amuccu mountain, Upper Essequibo river.
315	"	... Between Mora and Ireng river.
316	"	... Siparuni river.
317-318	"	... Between Itabru and Christmas cataracts.
319	"	... Pacaraima mountains.
320-322	"	... Siparuni river.
323-324	"	... Pacaraima mountains.
325	Felstone	... Marakang, Pacaraima mountains.
326	"	... Between Itabru and Christmas cataracts.
327	"	... Demerara and Essequibo rivers on Cumparu path.
328	"	... Siparuni river.
329-330	"	... Christmas cataract, Berbice river.

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NO.	DESCRIPTION.	LOCALITY.
331-333	Felstone Mora, Rupununi river.
334	" Pacaraima mountains.
335	" ...	... Cassikitu, Upper Essequibo.
336	" ...	... Above Wonotobo cataract, Corentyne.
337-338	" ...	... Essequibo river.
339	" ...	... Mora, Rupununi river.
340	Petrosilex " "
341	Porphyritic felstone	... Itabru cataract, Berbice river.
342	" ...	... Near Marlissa rapid, Berbice river.
343	" ...	... Pacaraima mountains.
344-346	" ...	... Burro-burro river.
347	" ...	... Archieculleck village.
348-350	" ...	... Between Mora and Ireng river.
351	Granitic quartz-porphyry	... Near Tomatai, Corentyne river.
352	Decomposed granite	... New river.
353	Granulite ...	... Mariwaru, Barama river.
354-357	Granite with garnets	... Upper Essequibo, above King Wm. IV. cataract.
358-359	" with opalaceous quartz " "
360	" " ...	Corentyne river, below King Fred. Wm. IV. cataract.
361	" " ...	... " Wonotobo cataract.
362-363	" " ...	Upper Berbice river.
364	Gneissose granite	... " Rupununi river.
365-373	Granite "
374	" ...	... Curiebrong river.
375	" ...	... Christmas cataract, Berbice river.
376-379	" ...	... Mazaruni river.
380	" ...	... Cuyuni river.
381	" ...	... Anourime inlet, Rupununi river.
382	" ...	... Canyaballi river.

NO.	DESCRIPTION.	LOCALITY.
383-386	Granite	... ... Cuyuni river.
387-388	"	... ... Essequibo river.
389	"	... ... Demerara river.
390	"	... ... Barama river.
391	"	... ... Waini river.
392	"	... ... Calishadekeur rock,
393	"	... ... Otonam rock, Quitarro savannah.
394-397	"	... ... Quitarro savannah.
398-399	"	... ... Apaoqua, Barama river.
400-401	"	... ... Near Enamouta, Pacaraima mountains.
402	"	... ... Groote creek.
403	"	... ... Ataraipu rock.
404	"	... ... Shea "
405	"	... ... Rewa river.
406-408	"	... ... Quitarro river.
409	"	... ... Cutari river, Corentyne.
410-411	"	... ... Near Mabouroo, Demerara river.
412	"	... ... H. M. Penal Settlement.
413	"	... ... Curiebrong river.
414-416	"	... ... Mazaruni river.
417-419	"	... ... New river, Corentyne.
420	"	... ... Near Marlissa rapid, Berbice river.
421	"	... ... Taruma Field, Upper Essequibo river.
422-427	"	... ... Upper Berbice river.
428	"	... ... Wonotobo cataract, Corentyne river
429	Coarse granite veins	... Cuyuni river.
430	" "	... Quitarro river.
431-433	" "	... Sir W. Raleigh's cataract, Cuyuni river.
434	Granite with schorl crystals	Upper Corentyne river.
435	Schorl from granite	... " "
436	Felspar	Above King Wm. IV. fall, Essequibo river

NO.	DESCRIPTION.	LOCALITY.
437	Syenite	... Barama river.
438	"	... " Cariacu.
439-440	"	... Demerara river.
441	"	... Carabung river.
442	"	... Cuyuni river.
443	"	... Between Surama and Annai.
444	"	... Cuyuni river.
445	"	... Rupununi river.
446	"	... New river, Corentyne.
447	"	... Above King Wm. IV. fall, Essequibo river.
448	"	... Curiebrong river.
449	"	... Surama savannah.
450	"	... Between Surama and Annai.
451	Syenite	... Below King Wm. IV. cataract, Essequibo river.
452-453	Quartz from syenite	... Anourime inlet, Rupununi river.
454	Hæmatite (specular iron ore)	... Daruwow, Upper Rupununi savannah.

The Settled Portions of the Barima, Waini, and Amakura Rivers.

By H. I. Perkins, F.R.G.S., 1st Government Surveyor.

 O anyone who is a good sailor and fond of the sea, a journey to the Barima River, in a comfortable schooner or sloop, such as those which belong to the Police Department of this colony, may be recommended as one of the most pleasant and enjoyable short trips within his reach.

The shortest and quickest route to the Barima is by sea to the mouth of the Waini River, and thence through the Morawhanna passage; another way is by sea direct to the Barima mouth; and yet another, but the longest and a very tedious one, by sea to Suddie, thence overland to the Anna Regina Water Path, and on by boat through the Tapacooma Lake, Pomeroon, Moruca, Barramanni and Waini Rivers, to the Morawhanna passage.

The journey to the Waini occupies from twenty-three to twenty-four hours, and, with a fair wind, a fine cloudless sky, and a well-kept craft, proves enjoyable in the extreme.

The larger schooners usually take a course of from seven to ten miles from shore, where the water loses much of its muddy colouring and is of a pale grass-green instead of a dirty brown. The sea is full of swarms of medusa-like bodies which are present literally in millions; and occasionally one sees numbers of the Portuguese man-of-war floating lightly on the surface of the water, shining with iridescent hues in the bright sunlight. But

it is at night, our glorious tropical night, when the constellations shine with such distinctness through the clear air, that the sea presents the most charming of sights; for the water is then vividly phosphorescent, and as the vessel ploughs her way through it, she leaves a perfect galaxy of light behind her, while around her is an ever-present halo of twinkling star flashes. Far away to where the crest of some wave breaks into foam, a faint glimmer, rendered pale and ghostly by the distance, rests on the water, like the wraith of some drowned mariner whose body has long ago sunk peacefully to rest to the bottom of the great unchanging ocean.

As the mouth of the Waini is neared, a few low forest-clad hills can be seen close to the horizon on the southwest, rising up above the long low streak of wooded coast line. They are situated on the Arooka, a stream tributary to the Barima, and are composed of hæmatite, sand, and clay.

At its mouth, the Waini is about two and a half miles in width, but extremely shallow and quite unnavigable for vessels drawing much water. The banks are low, chiefly mud, though sand and caddy occur near the mouth, and particularly on the east side where there are a few rough huts erected and used by the inhabitants of the Upper Barima, who sometimes come to fish close by.

Higher up, the banks are all mud, except near the falls where there are sandy beaches.

On the west, about two miles up from the sea, is to be noticed what is supposed to be the site of a pitch lake, which presents a curious appearance when seen from a distance, for the dense mass of green forest suddenly

changes to a dull, dead white, for about a mile ; and bare, gaunt, leafless trees spread out their withered branches against the sky. It is impossible at a venture to surmise what has caused the death of the vegetation. Perhaps there is really a substratum of pitch below the mud on top, for thick brown mud is the surface covering, and the tree roots may have struck this impenetrable substance, and meeting with no nourishment therefrom have died. The only way, however, to test the truth of the reported presence of bitumen, will be to make borings or excavations for some considerable depth downwards, and very possibly something of that nature may be discovered.

There certainly does appear to be an indication of the presence of petroleum, for in many cases the surface of the small pools of water at the place is covered with a thin film of oleaginous matter, which phenomenon occurs also near the Barima sand Police Station at the Barima mouth.

About six miles from this putative pitch lake, and on the same bank of the river, is the Morawhanna or $\text{\textcircumflex} \text{Eta}$ palm passage, about ninety yards in width, which leads by a more or less winding course of six and a half miles to the Barima River.

At its Waini end, it is the haunt of numbers of water fowl, currie-currie (*Eudocimus ruber*), muscovy ducks (*Cairina moschata*), and wicissi ducks (*Dendrocygna autumnalis*), besides the local snipe (*Gallinago frenata*), and one or two species of sandpiper and other waders. Occasionally a heron (*Ardea*), may be seen standing statue-like at the side of the stream, or, when alarmed, winging its heavy flight into the forest beyond. Parrots

and wood doves are met with higher up, while now and then one disturbs from their fishing a ducklar and his mate (*Plotus anhinga*).

A peculiar feature of this passage is the remarkable swiftness of its current, both at ebb and flow, and the presence of large trees which have been washed down and anchored by their roots, and have become fixed in the centre of the channel, where they sway, bend, creak and groan, as the water swirls past them at the rate of five or six miles an hour. As the distance from the sea of the Barima and Waini ends of the passage, is respectively fifty-one and eight miles, there is considerable difficulty in comprehending the state of the water in the passage, for sometimes it is falling at one end and rising at the other, and *vice versa*, or rising or falling at both ends, according to the state of the tide in the sea at the time.

At the Morawhanna mouth, the Barima is about two hundred and ten yards wide and from eighty to ninety feet deep ; the water is of a dark brown colour, and sweeps away on either hand in bold, broad, wind-swept reaches. At various points where the bush has been cleared away along the bank, little clouds of smoke betray the presence of the settler or squatter, who has made a home for himself and is busily engaged in cultivating many kinds of ground provisions.

In all there are some fifty or sixty different clearings situated on the banks of the Waini, Morawhanna, Barima, Arooka, Kaituma, and Amakura Rivers. Nearly all of them are well drained, being provided with dams and trenches, and outfall kokers. The land has, in the first instance, been cleared of bush by Indians (employed for the purpose, as they are more accustomed

to the use of the axe than the Portuguese and other settlers), and then planted up. The owner of a clearing usually does most of the work on it himself, but some employ coolies, or Indians, or black people. The Indians belong for the most part to the Warrau tribe, though there are Caribs and Arrawaks also to be met with. Near the mouth of the Barima is a Warrau settlement, situated some distance from the river-side, the road to which lies through a heavy swamp and is composed of tree trunks laid lengthwise, end to end, and affords at best a precarious foot-hold. All communication between the settlements is by water, and there is a curious system of itaboos, or water-ways, leading from one river to another, so that in the rainy season it is possible to pass from the Moruca River directly into the Orinoco without putting to sea once.

As is usual in such districts, nearly every one possesses either a woodskin, corial or bateau; while one or two of the more wealthy settlers own small schooners or sloops, which they employ to convey to town the produce of their provision lands, such as tannias, corn, plantains, bananas, and yams. Owing, however, to the unfavourable winds which frequently blow for long periods in a contrary direction, and make the passage from the Waini to town of several days' duration (sometimes as many as seven or eight), the more easily perishable crops become over-ripe and spoil, and great hardship is thus inflicted on the squatters. Corn, therefore, is by far the most remunerative crop, and there is a small trade done in it with schooners which come from Bolivar, on the Orinoco, or from one of the ports in the Gulf of Paria; but there is no regularity in their visits,

and in consequence most of it comes to Georgetown.

The land seems to promise well for cocoa, for though flat and swampy, it is extremely fertile, being dark, rich, and heavy, and easily drained. In appearance the soil looks like a heavy peaty clay, mixed with fibrous roots, and largely composed of decayed vegetable matter. Cocoa would of course be less liable to spoil in transit than the ordinary produce, and if carefully packed would be almost proof against deterioration; but it is notoriously a crop which requires a long waiting, and the settlers could scarcely afford to plant it; though, in the end, it would pay them very much better than anything else.

On one or two of the hills in the Arooka River there are both cocoa and coffee trees of very considerable age. Some are quite surrounded and choked by the bush that has sprung up by them; while the name of the planter is already lost in obscurity.

In the event of a large and regular fruit trade being established between this colony and the United States of America, the whole portion of the district watered by the Barima, Amakura and Waini Rivers and their tributaries, below their falls, would offer a magnificent field for enterprise as a fruit-producing region, both on account of its extreme fertility and of its easy access by water, whereby the number of trans-shipments of the produce would be considerably fewer, and the risk of damage thereto materially lessened.

The Waini it is true is very shallow, but no doubt this difficulty could be easily overcome. The Barima and Amakura on the contrary are deep, and would

permit of the passage of vessels of large size, which could be loaded at the very farms where the fruit would be grown. The amount of land now lying idle can be reckoned literally by hundreds of thousands of acres, and is, to outward appearances, as judged by following the course of the various rivers, uniformly flat, rich, and swampy.

A peculiarity of all these western streams is the absence of mucco-mucco (*Montrichardia arborescens*) from their banks; and this is the more extraordinary and incomprehensible, when it is considered how very abundant this plant is on all our more eastern rivers. For many miles on the Barima, etc., nothing green meets the eye but one almost unending wall of mangrove trees (*Rhizophora mangal*), which renders the scenery somewhat dull and uninteresting; though, as if to make up for this monotony, the trunks of the trees are in many places covered with a small profusely flowering orchid, whose sweet smelling blooms possess quite a strong odour of fresh honey. Now and then too one sees the flower spike of another common arboreal orchid, *Oncidium altissimum*, which throws out a spray of yellow and brown blossoms, some twelve to fifteen feet in length, that sways gently to and fro in the breeze like a delicate lace streamer.

As the Morawhanna passage is neared, one catches at intervals glimpses of troolie palms (*Manicaria saccifera*) and other trees in the bush, behind the fringe of mangrove. This is, however, very seldom, and the mangrove is the predominant tree on the river bank. Over their tops fly numbers of macaws (*Ara, sp.*) and parrots passing to and from their feeding grounds in the æta palm swamp

situated far from the river side ; and sometimes the white-headed maroudi (*Pipile cumanensis*) and powis (*Crax alector*), frequent the riverside near the same spot.

Animal life does not appear to be very abundant in the district, owing perhaps to the vast extent of swamps all around. The only mammal of any peculiar interest that I was able to procure, was a species of bat (*Thyroptera tricolor*) which has curious circular suckers on its wings and legs, one on each wing near the shoulder, and one on each leg. Besides these it is provided with the usual hook-like appendages on the shoulders, and the small ill-developed feet common to this order of animals. It was discovered, along with many more of the same kind, inside the partially unrolled leaf of a plantain tree, to which it was no doubt fastened by its suckers. I have a belief that there are many strange forms of insects to be discovered in the neighbourhood, and hope to devote some spare time to them on a future occasion. Fish abound in the rivers, chief amongst them being the *Morocot*, which sometimes attains a large size and weighs upwards of twenty or thirty pounds. The inhabitants dry and salt them, and if this were done more largely it would form a valuable article of commerce, particularly in the colony itself.

There is, for the immense size of the district, a very well regulated system of Police Stations established—one at Barramanni capable of accommodating some three or four men with an Inspector's quarters, a lock-up, etc. ; another at the Morawhanna for six constables and an inspector, with lock-up, boat-house, stelling, etc. ; and another at the Barima mouth, where quite 20 men could be temporarily billeted. The erection of another station is contem-

plated at the Amakura river, and with this the water-ways for the whole of the North-Western District will be efficiently guarded and patrolled. This will give every feeling of security to those already settled in the district, and to intending settlers ; so that, with the advantages already enumerated, the land should be rapidly taken up, and a prosperous future confidently expected for it.

A Fragment of Berbice History.

By C. G. Young, M.A., M.D.

ROM the first introduction of slaves, the preservation of the internal tranquillity of the colony was a matter of great anxiety to the colonists and the government of the day—an anxiety which increased with the population. With the exception of a handful of soldiers at Fort Nassau, far up the Berbice River, and at Fort St. Andries (now part of the Lunatic Asylum lands), at the mouth of the Canje Creek—kept there more to prevent foreign invasion and to look after the shipping—there was no regular force to keep down disturbances on the estates or oppose the attacks of the “runaways,” until the Burgher Regulation was passed by the Governor and Court of Government of the Colony of Berbice, on the 9th January, 1768, and the Burgher Militia of Berbice raised. Peace depended on the mutual efforts of the residents on the estates. Under this regulation the residents were called on to obey the order of the burgher officers when they, pursuant to superior orders, and for the benefit and security of the colony in general and of each inhabitant in particular, were under the necessity of directing that an expedition into the woods be made against runaway negroes.

This regulation stipulated that :—

1.—All inhabitants, in conformity to their oath to the Governor and Council, shall obey and respect the burgher officers, and comply with their orders in all matters re-

pecting the "Public Service," without any resistance or opposition: and in case of a contrary behaviour on their part, they shall, on the complaint of the officers, incur a penalty of 300 guilders; the court reserving to itself the increasing of such fine or the inflicting of another punishment on the offenders as circumstances may require.

2.—In case of an expedition either for pursuing runaway negroes or other purposes required by the public service, each estate shall furnish such a number of whites and slaves as may be demanded of it; and it is also ordered on such occasions, that the burgher captains or the officers who, on account of the former's being absent or otherwise prevented, may command in the district, shall apply to the Governor or the nearest member of the Court of Government, in order to concert the mode of carrying such expedition into effect in the most equal manner with respect to the furnishing of whites and slaves; and that a relative equality on this head may the better be observed, every owner, attorney, or manager of any estate or estates, shall be obliged to give in every year, in the month of January, to the burgher captain of his district, a return of all the working or efficient men-slaves on such estate or estates. Those who shall omit giving in such a return, to incur for the first time, a fine of fifty guilders, for the second of their so omitting, a fine of 100 guilders, and for the third time, such correction as the court, according to the exigency of the case, shall judge proper.

3.—No persons shall be exempt from such requisition, but be obliged to render the assistance demanded of them; and if any person shall neglect in case of any

expedition being set on foot, to furnish the fixed quota of whites and slaves and to send them to the place of rendezvous appointed, he shall incur for such neglect, a fine of 300 guilders, or even, should circumstances require it, be punished as a perjurer.

As experience had manifested that there were persons in the colony who, notwithstanding this regulation and the oath they had taken on the same, thought proper not to obey the burgher officers, it was modified and renovated in an extraordinary assembly held at the Court House in New Amsterdam, on June the 6th, 1799. Present:—His Excellency A. J. VAN IMBYZE VAN BATENBURG, Governor-General, President, and the Honourable Counsellors I. de VRY JACOBZOON, J. C. W. HERLIN, L. C. ABBENSETS, A. DONZEL, L. H. BUSE, and J. TAPIN.

Beside these duties mentioned the burgher officer had to keep a return of all the runaway slaves from his district, and to see that the law was administered within its boundaries, which were very well defined. The colony was divided into ten districts, these being:—

- 1.—The town district from the west bank of the Canje Creek to Overwinning sideline on the east bank of the Berbice river, and including New Amsterdam and the town estates.
- 2.—The Canje Creek district, including all the Canje estates and the creek to its source.
- 3.—The east sea coast district from the east banks of the Canje Creek to the west bank of the Devil's Creek, and including Fort St. Andries.
- 4.—The Corentyne coast district extending from the east bank of the Devil's Creek to Lot 80 (Skeldon). There could not have been much traffic to Skeldon and

Eliza and Mary in those days, overland, when the Government could get no reply to applications for tenders to keep the ferry over 66 creek.

5.—The east bank district extending from Overwinning to Christina's Lust on the Berbice River, and including Pln. Providence, Everton, Friends, and Highbury.

6.—The middle district from Christina's Lust, including both banks upwards to Fort Nassau.

7.—The upper district from Fort Nassau upwards as far as the river was inhabited.

8.—The west bank district from New Berensteyn to the upper bank of Kabour Creek.

9.—The lower west bank district from the lower bank of Kabour Creek to Rosignol.

10.—The west sea coast district extending from Rosignol to the Abary Creek.

To facilitate communication with Fort St. Andries along the sea coasts, flag stations were erected at various places with flagstaffs 60 feet high, and a code of signals—a plan of Major Ratterij's—adopted so that they could tell at the Fort if any disturbance had arisen. On the west coast there was a station on each of the following places:—No. 8, Bath, Lovely Lass beyond Hopetown, Lot 28, Weldaad, and the Abary Creek. On the east coast the stations were on Susannah, Industry, East Lothian, and at the Devil's Creek.

For service in the militia, an age limit was fixed—men between the ages of sixteen and fifty only being required to serve. Each man, the officers excepted, had to provide himself with a musket capable of carrying an one ounce ball, cross belts, cartouch box to contain twenty-four cartridges, two flints, a pricker

and a brush; also as uniform, a shell of white Russian sheeting with green collar and cuffs, white pantaloons, and white gaiters.

The officers had to provide themselves with a green shell with black velvet collar and cuffs, a white vest, pantaloons, and gaiters. There was no mention of helmets or bayonets.* There was one company for each district, and certain rules were laid down for time of training and exercise, and when to come up for inspection; and in case of a disturbance they were directed to muster at one particular spot, the head-quarters of the company, where there was a flagstaff. The signal was, in the day time, the firing of two shots and the hoisting of a red flag; at night, the two shots and the hoisting of two lamps. In the town district the rendezvous was at the flagstaff in front of the Colony House; in the Canje Creek, at Pln. Adelphi; in the east sea coast district, at Pln. Kendals; in the Corentyne coast district, at No. 11 (beyond Pln. Port Mourant) and Kitearn; in the east bank district, at Brothers; in the west bank district, at Bestendigheid; in the middle district, at Pln. Essendam; in the upper district, at Pln. Maria Agnes; in the west coast district, at the Abary Creek; and in the lower west bank district, at Ithaca.

The only persons exempt from serving were members of the Government, parsons, doctors, and Indians.

Such a contribution of whites and slaves must have been a heavy tax on the estates' proprietors, especially as

* In Captain Stedman's Narrative of an Expedition against the Revolted Negroes of Surinam, 1772-77, the drawings show some of the soldiers carrying bayonets and some not: the head-gear depended on the taste of the wearer.

riots and raids from the runaways were frequent. This system of police had nothing to do with attacks from the outside. To prevent invasion special arrangements were made, and instructions given, for a yearly return of all able-bodied residents on the coast estates, that immediate intimation should be sent to Fort St. Andries of the first appearance of invaders, and that the bridges should be pulled down and the roads destroyed between the place of landing and New Amsterdam.

Besides all this, on the advice of Sir Ralph Abercromby, Commander-in-Chief, in 1797, the Governor-General and Court raised and furnished a company of black troops which were to be added to the corps of South American Rangers in Demerara, at this time commanded by Lieutenant-Colonel Hislop, for the mutual protection of the two colonies. The company consisted of one hundred and twelve negroes, viz., five sergeants, five corporals, two drummers, and one hundred privates, and was raised by asking so many men from each estate according to its size. The town and fort at Nassau contributed one man, and the shops in New Amsterdam five.

Each of the following estates gave one man:—Eduard, Mon Choisi and Eddertown, and Zee Zight (now called Cotton Tree), Zorg-en-Hoop, De Vryheid (town estate), Fransenburg, Augsburg, Jacoba Wilhelmina, De Hoop, De Vrouwe Johanna, Grauw Bunderland, Johanna, Farm, De Gennes, De Catoenboom, Ross, Zeeburg, Washington, Williamstadt, Ruimzigt, Overyssel, Rotterdam, Novit Gedagt, Welgeleegen, Stevensburg, Paradise, Middelburg, Welvaren, Perseverance, Bellevue (now part of Everton), Vigilantie, Het Plegtanker, La Pru-

dence, Prins Willem de Vde, Dankbaarheid and Nomen Nescio, Ithaca, Catharina Rust de naarstigheid en de onderneeming (between Bath and Hopetown), La Fraternit, Beatendigheid, Sans Souci, Beerenstein, Horstenburg, Golden Fleece.

Each of the following estates gave two men :—Nieuwe Hoop, Buses Lust, Schepmoed (where the Magistrate's Court now stands), Waakzaemheid, Bloemhoff and Prosperiteit, Anna Clementia, Resolutie, Op hoop van Beeter, Blyendaal, Gelderland, Standvastigheid, Dageraad, St. Hague, L'Esperance.

Each of the following estates gave three men :—Leifde, Essendam, Utile and Paisible, Den Arend and La Tranquillite, Santvoort, Lust tot Rust, Zuidwyk, Schumachers Lust, De Herstelling, Mara and Germania, Cruizburg and Dankbaarheid.

On the first of June in the same year, it was further settled that the above specified proportions were to be furnished and forwarded, on Saturday the first of July next, to Fort St. Andries, where Lieutenant-Colonel HISLOP would attend on that day, in order to examine the negroes, and to receive them if approved of.

The negroes to be furnished were to be tall and able-bodied men, every way fit for His Majesty's service, and consequently were to be such as bore a good character, and were free from any rupture or sores whatever, and so far as could be ascertained, of the age of seventeen to five and twenty years.

For each negro furnished, in consequence of this order, the person furnishing the same was to receive a sum of one thousand guilders. In order to find the necessary funds for this compensation, and that the whole colony

might in due proportion contribute, the slaves were taxed at the rate of nine guilders per head. The whole of this Capitation Tax was ordered to be paid in the course of the same month to the Receiver-General, Peter Hagens. With this view it was enacted that persons who were not possessed of estates should make payment in specie or in colony bills; and that those who did possess estates should have orders drawn on them by Peter Hagens for the amount of their proportion, payable at sight, in current coin of the colony—the orders not to exceed 100 guilders each.

Whoever preferred it had permission to pay in cash, provided it was paid before the end of the month.

Those living in the colony in those days must have had a rather lively time of it between the fear of invasion on the outside, the discontented on the estates, and the runaway slaves in the interior of the county. As trouble diminished on the sea, it appeared to increase on the plantations among the people, and came to a head about the year 1814. Up to this date, year after year, some ordinance was passed restricting, little by little, what freedom the slaves possessed.

To prevent them communicating with one another, they were not allowed out at night in the town after seven o'clock without a lamp and a pass from their owner stating whither they were going; and this pass could be used only once. No slave was allowed to go from one estate to another at night; if found so doing, they were put in the stocks. They could not possess a canoe; and to prevent communication by signals, they were not allowed to sing in the boat passing up and down the rivers, nor travel in a boat at all without a white accom-

panying them. Dancing on estates was prohibited from March, 1814, to the year 1815.

This curtailing of the liberty of the slaves was forced on the Government by the increasing discontent among the black population, as a possible means of keeping them more under control, and as a preventative against combination.

The number of whites in proportion to the general population was small, so that in the event of a general rising there would be but a few to oppose it; and experience had taught them, in the years prior to 1768, that the tender mercies of the bondsmen were cruel, and that the latter had a natural tendency to wipe off old scores with interest.

About the year 1804 an ordinance was passed forbidding anyone to possess an estate unless a white resident was kept.

Notwithstanding all the precautions of the Government, a premeditated rising took place on the east and west sea coast; but the authorities, having received intimation of it, were prepared, and put it down with a high hand. So many slaves were killed and executed in the process that on October 6th, 1814, an ordinance was passed taxing the colony to raise funds to compensate the owners for their loss.*

As it was the duty of those in authority to preserve the peace and put down rebellion, even at the expense of the lives of the rioters, it was incumbent on them to encourage the faithful and those that had supported

* Mr. Darnell Davis states that compensation to owners for slaves, executed for crimes, was abolished in Demerara in September, 1795.—*Timehri*, Vol. II., Part 2, p. 352.

them by giving rewards for services rendered; and although virtue is its own reward, no doubt then, as now, this quality was more appreciated by the individual when it brought with it something more tangible. To what extent payment or reward for good services was carried, is unknown; but there exist here and there in the Colony, tokens or medals so given, which have escaped the tooth of time and the crucible of the jeweller; and for a people so peculiarly placed as were the slaves, the Government could have chosen no better or more economical gift, since they necessarily would make the wearer conspicuous among his companions, and would act as an incentive to others to similar good service and conduct.

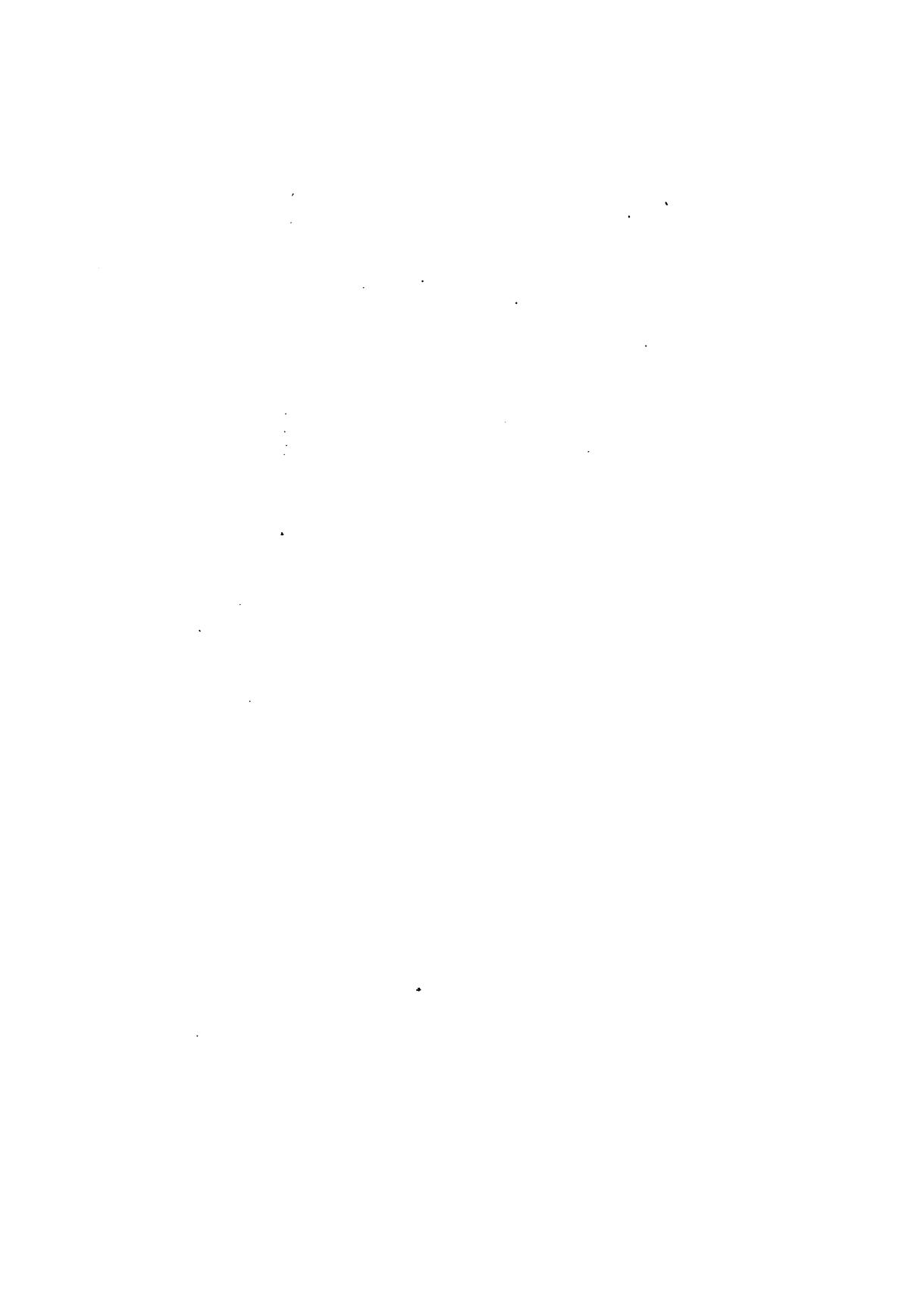
Of such rewards, figures are here given of two silver medals, on each of which is inscribed the services rendered by the recipient.

One, given in 1810 for faithfulness—more valuable than bravery in those days—displayed in an expedition against the runaway negroes, bears the inscription in Dutch, on one side:—"Voor Getrouwheyd van Vigaro"; and on the other:—"Betoond op den 7th Jan., 1810. In een attaque teegens enn dorp Bosche Negers onder hit commande van L. F. Gallez, Burgr. Capt., a Berbice"—For fidelity of Vigaro shown on the 7th January, 1810, in an attack against a village of bush negroes, under the command of L. F. Gallez, Burgher Capt., Berbice.

The other medal was given by the members of the Court of Policy to "Alexander" of Pl. Bath, for services in connection with the riots on the west sea coast in 1814. Obverse:—The monogram, C.B. (Colony Berbice) within a wreath of oak and sugar cane. Reverse:—An inscription acknowledging his faithful services.

Voor
Getrouwheyd
van
Vigaro

From
The Honble Court of Policy
of the
Colony Berbice
To
The Negroe Alexander
of D^r N^o 17 West sea Coast
as an
Acknowledgment
of his Faithful Services
to the
Colony Berbice
Anno 1814



It was commonly believed at the time that the disturbance in 1814 was in great measure the result of a rumour that the English Government had granted freedom to all the slaves—an apple of discord that fell on Barbados a few years later.

The Spread of Leprosy.

*By John D. Hillis, F.R.C.S., late Medical Superintendent of the
Leper Asylums.*

T was the custom some years ago for long and frequent discussions to take place in the legislature of the colony with reference to the spread of leprosy, and the consequences it entailed on every member or class in the community ; but latterly, whether owing to all danger in this direction having passed away, or to the apathy natural to those who dwell long in hot climates, all interest in the subject would appear to have died out, if one may judge from the absence of all serious discussion, and any practical steps taken to mitigate an acknowledged evil in our midst. The object of the writer is to endeavour to direct attention once more to a subject which has occupied his thoughts for more than twenty years, during ten of which he was in charge of the colony's large leper institutions at Mahaica ; and to urge on his fellow-colonists, as strongly as words can possibly do so, to look this subject steadily in the face, unsavoury though it be, with the dangers they run by neglecting it, and to realize its extent and importance to one and all, and not to rest satisfied till something be done to relieve the inhabitants from the consequences of the spread among them of a disease, already more than serious in its proportions, and which threatens to become much more so.

All classes of the community are more or less liable to leprosy, if predisposed to it by ill-health or skin disease, and if exposed to contact with a diseased person.

It must not be imagined that any are exempt by reason of their nationality, for leprosy has frequently been communicated to Europeans, as well as the other races, in this colony and elsewhere.

The Ven. Archdeacon WRIGHT, of England, who has taken a great deal of interest in the subject of leprosy, and has been in communication with authorities on the matter in all parts of the world, has been occupying the minds of the people at home by discussing in the columns of the *Times* the question—"Leprosy: are we in danger from it?" The Archdeacon has handled his subject in a masterly manner, and has attracted considerable attention; and this not only in the lay press of the country, since he has compelled the medical papers to take notice of, and refer to, his statements with reference to the increase of leprosy of late years in England. If the discussion of such a subject is deemed worthy of consideration by the people of England where there cannot be more than about twenty or thirty cases, how immensely more important should it be to the inhabitants of British Guiana where leprosy is so rife and so largely on the increase—and to such an extent of late years, that it is calculated at the present time that one in every two hundred and fifty persons is a leper!

But the question may be asked:—Is leprosy so seriously on the increase in Demerara? It is highly important that a decided answer should be given to this question, and there can, I conceive, be but the one. To the most casual observer the increase must be apparent, irrespective of the fact that the asylums cannot be enlarged fast enough to contain the cases that are compelled by want and the rapid advance of the fell disease to seek admission

and relief within their walls ; whilst hundreds of others, it is well known, do not enter but remain outside to mingle with and contaminate their surroundings. A disquieting answer truly is to be found in this fact ; but further on in this paper it will be seen that not only is leprosy on the increase in the colony, but that the increase has been greatest in the last decade. Wherever the writer goes he meets with lepers walking about among, and mixing with, the people, may be in church, or in shops ; and as the signs and symptoms of the disease become better known, they will perhaps be more easily recognised by the uninitiated.

Before proceeding, it may be desirable to state briefly some of the characteristics of leprosy as far as may with propriety be done in the columns of this journal, in order that we may have some idea of the more prominent symptoms of one of the most loathsome maladies the human race is subject to, compelling them, unhappy mortals, ever to cry "Unclean ! unclean !" and then to glance back for a moment at its past history, and trace its introduction and gradual progress in this our colony.

For this purpose it will be only necessary to describe two forms of leprosy :—I. The tubercular. II. The anæsthetic. I. Tubercular leprosy, known also as the lion-like disease, black leprosy, satyriasis, &c., is ushered in by premonitory fever, and followed by an eruption of excrescences called tubercles, hence its name. After a time the latter come out over the face, ears, &c., distorting the features, disfiguring the body, and invading the air passages. After an interval this is followed by fresh exacerbations of disease and successive crops of tuber-

cles ; until the whole system becomes contaminated, the blood poisoned, and the internal organs affected ; and the wretched sufferer, shunned by his fellow creatures, dies either from the exhausting effects of the disease or some internal complication—death putting an end to his sufferings in about nine years on the average. Negroes are more prone to this form of leprosy than any others, and it is the most fatal form of the disease.

II. Anæsthetic leprosy, known also as Leuke of the Greeks, Baras of the Arabians, Joint-evil of the West Indies, Sunbahirii of the East Indies, and dry leprosy, in contradistinction to the other form also known as humid leprosy, is characterised by a diseased condition of the nerves, and a peculiar eruption, the primary characteristic of which is loss of sensation, or anæsthesia, hence its name. After a time ulcerations form, a sort of dry gangrene of the limbs sets in, and joints drop off, and finally there is more or less paralysis. It would take a large volume to describe the signs or symptoms of leprosy, but the preceding account is sufficient to show what an alarming affection we have to deal with.

The earliest accounts of leprosy in the colony are neither full nor important ; but such as they are, they all point to the fact that leprosy was originally introduced here by slaves from Africa, where the disease has existed from time immemorial. The earlier colonists were quite familiar with the appearance of leprosy as it affected their slaves, and strict measures were taken to isolate them from the others ; hence it did not spread to any great extent. Leper slaves were generally employed as watchmen aback at the provision grounds, where the well-known watch house is, and used to be. Here he was

kept as isolated as possible, and the disease prevented from spreading. When, however, immigration commenced, leprosy was introduced from India, first by the ship *Colgraine* in 1842 and by the *Ganges* in 1858. In 1861 several Chinese immigrants arrived here with leprosy, and also in 1862 by the ship *Agra*, so that the disease, which hitherto had been principally confined to the black and coloured races, soon began to spread to the immigrant population. To-day there are at the leper asylum over 200 East Indians and Chinese suffering from leprosy, to say nothing of the cases on the sugar estates and the Georgetown and Berbice contingent. In 1831, according to an official paper at the Government Secretary's Office entitled "Return of leprosy *negroes* in the Essequebo division of the united colony of Demerara and Essequebo," there were some 431 leper *negroes* in Demerara; then commenced immigration and the new departure, when lepers were allowed to mingle freely with the community. At the present time it is calculated that there must be more than 1,000 cases of leprosy here, or 1 in every 250 of the population, and this notwithstanding the large number that die annually from the disease—over 16 per cent. Will the inhabitants of this country be content to allow this increase to go on at the same rate during the next few years?

In 1832 the poor and disabled lepers were removed to the mouth of the Pomeroon river, and a more unsuitable place, under the circumstances, could not well have been found, its distance from Georgetown being its only recommendation. At this place there was what is known as an Indian Post—a collection of Indians presided over by a Government Officer, and supposed to be in the en-

joyment of British protection. Among these unsuspecting children of the forest, the colony cast its load of disease. The Indian tribes at the time were Caribbees, Accawois, Arrawaks and Warraus. Mr. ZIMMERMAN was the Prote^rtor, and he used to include in his account for the Indians those pertaining to the maintenance of the lepers. Soon after, we read in one of his reports that "the Indians manifested an inclination to leave the Post." Certain tribes did go away, and refused altogether to associate with the lepers; but one tribe, the Warraus, who are lowest in the social scale among Indians, remained, ate, and drank with the lepers, and mingled too freely, alas! with them; for shortly after, leprosy broke out among the Warraus, and to this day they are the only tribe among whom cases of leprosy may be met with. It certainly is a fact that no one has ever met with leprosy in any other aboriginal tribe of Indians. Mr. MCCLINTOCK, for years a magistrate among them, states* :—"On taking the census of the whole Indian population (1842), although many cases of leprosy of both sexes came under reporter's observation, every case was confined to the Indians of the Warrow nation."

In 1858 the lepers were located at the present institution at the mouth of the Mahaica creek, which not very long ago was enlarged to meet the ever increasing demand on its accommodation. On 31st December, 1859, there were only 105 inmates at the Asylum. In 1869 they had increased to 300, and the place could hold no more. Increased space was provided, and in 1889 we

* Leprosy in British Guiana, p. 160.

find from the official reports that over 500 were dealt with. Around this Leper Asylum, outside its boundaries, there are large numbers of lepers not included in these returns. If leprosy be not contagious, how comes it that these cases of leprosy exist outside the Asylum in larger numbers than in other parts of the colony? And it should be remembered that there is no isolation at the Asylum, but that the lepers can go in and out as they please.

It being conceded then that leprosy is on the increase here and elsewhere, it naturally behoves us to try and ascertain in what manner, and by what means, the disease thus spreads, with the view of suggesting a remedy if such can be found.

Leprosy may be transmitted by (1) Intermarriage or cohabitation and (2) Inoculation or contact.

(1.) Intermarriage with or among lepers must account for a certain number of cases. Those in which both parties are leprous and marry, are doubtless few and far between; the greater number of lepers who cohabit do not marry, the leper man may live with a healthy woman, or *vice versa*. It has been conclusively proved that if a man with leprosy marries a healthy woman, in time the latter will become affected. It may be as many as nine or ten years before the disease makes its appearance, but appear it almost surely will, if long enough time be allowed to elapse. Cases in point have occurred in this colony in the writer's own practice and that of others; in particular, one may be related known to many local practitioners, viz., that of a leper shop-keeper who married a healthy woman. For eight years his wife, who had not the slightest taint in her family, remained perfectly free from any

symptom of the disease. The case had been pointed out as telling against contagion ; but in their ninth married year, the poor wife became leprous, and is now a fearful object to contemplate.

(2.) The transmission of leprosy by Inoculation or Contact has been the debatable point with the profession for many years ; but since the disease has been better studied, and the discovery of the *Bacillus lepræ*, a minute organism found in every case of true leprosy, opinion is gradually but surely coming round to the recognition that leprosy may be communicated by the unhealthy to the healthy to a much greater extent than has hitherto been considered probable. In 1867 the Royal College of Physicians of London, in their celebrated report of that year, gave it as their opinion that leprosy was not contagious, and on that dictum all recent legislation on the subject has been based ; but it is now known that the report was principally the production of one member of the Committee, Dr. GAVIN MILROY, who had paid a short visit to the West Indies, and had not had time to make himself conversant with all sides of the question. In more than one instance was an untruthful history related to the late Dr. MILROY, who had no opportunity of testing the credibility of the witness's statement. For instance, one man stated to him when the Doctor was in Demerara, at the Penal Settlement, that he believed his leprosy arose from the salt diet the prisoners are accustomed to ; whereas in fact the man had cohabited with a coloured woman who had leprosy, previous to his being sentenced to penal servitude, and a child of this same man and woman died at the Leper Asylum at Mahaica. In 1887,

however, the College of Physicians furnished another report, in the light of recent investigations into the subject, which materially modifies their former one, and they now state that under certain circumstances leprosy may be thus communicated. In the writer's own experience numerous cases have occurred in this colony in which there could be no reasonable doubt but that such was the case. It is manifestly out of the question to state anything further concerning them here, but it may be relied upon that the case is as I have stated. Some of them were most heartrending, the unfortunate victims having to be sent quietly out of the colony to prevent the matter from becoming known. One case in Georgetown made a deep impression with regard to the danger people run. A respectable young lad became leprous through, as I believe, playing with a boy who had leprosy, and who lived further down the street. When seen, he was in an advanced stage of tubercular leprosy, covered with sores, and he was sent home and treated by the late Sir ERASMUS WILSON, and the family left the house. I subsequently learnt that another family shortly after took over the same house without its having undergone any purification or disinfecting, and it must be remembered the boy had been confined for months to one room and was covered with these sores. Had he died of some endemic disease, considered contagious, but questionably so, how much money would have been spent on painting, papering, &c., by the authorities! But in the case mentioned no such steps were considered necessary. I am not finding fault with disinfection as carried out in Georgetown—far from it; it is merely contended that owing to the opinions that the Executive

have to guide them, they would not be justified, under the present rulings on the subject, in going to any expense under the Public Health Ordinance, as leprosy is not considered a contagious disease.

Dr. GAIRDNER, of Glasgow, in the *British Medical Journal* of 11th January, 1887, relates a startling case where leprosy was contracted by an European, and recently M. BESNIER read a paper before the Academy of Medicine of Paris, which showed conclusively that leprosy was propagated by contact; but owing to the long incubation period of the disease, it is most difficult to so trace contagion in a given case as to satisfy the exact requirements of science. One of the most interesting and painful episodes in the history of leprosy is that of the Sandwich Islands. In these Islands some years ago leprosy was unknown, but owing to the introduction of Chinese and others suffering from leprosy, the disease rapidly spread, and to-day at the Island of Molakai there is a large leper community comprised, on 1st April, 1888, of 942 souls, viz., 740 lepers, 144 friends and relatives, and 38 peasants or original inhabitants of the Island. Regarding this place, the *British Medical Journal* of 23rd February, 1888, states:—"The very extensive prevalence of leprosy in the Hawaiian Islands can no longer be denied, and it constitutes a very serious problem for the Government of that Kingdom. The mere expenditure in money annually reaches a very considerable sum, amounting probably to not much less than 5 per cent. of the total revenue. The evil has attained such large proportions that only by the most rigid enforcement of the law compelling the segregation of lepers can it be combated; this appears to be now fully recog-

nised by the Board of Health, but it was not always so, and it is impossible to avoid the conclusion that the laxness at one time permitted, has worked an amount of evil irreparable in this generation." How, it may be wondered, would our own Board of Health plead, if arraigned on a similar indictment?

This leper settlement will ever be remembered as the scene of the devotion and self-sacrifice of a priest of the Roman Catholic Church, Father DAMIEN. This worthy servant of His Master went out to Molakai to minister to the religious wants of the lepers, and himself became a leper. The latest accounts thus describe his condition:—"Father DAMIEN is falling a victim to his charity. Leprosy has done its worst on him, at turns at his ears, his eyes, nose, throat, his hands and lungs. The poor Father has suffered dreadfully. He is completely disfigured, his voice is almost extinct."*

The Sandwich Islands were also the scene of Dr. ARNING'S celebrated inoculation cases which attracted so much attention, and a full account of which is given in the *British Medical Journal* of 24th November, 1888. Dr. ARNING, whilst at Honolulu investigating this disease, obtained the consent of the Government to inoculate a healthy person with leprosy, the person to be experimented on being one who had been sentenced to death. He was promised a remission of his sentence on condition of his allowing the experiment. The operation was then performed, and for a long time subsequently with negative results. However on the 25th September, 1888, he was examined by N. B. EMERSON, M.D., President of the

* Since the foregoing has been in type, the death of this heroic man has been announced.—ED.

Board of Health, and J. H. KIMBALL, Government Physician, Honolulu, who gave the following certificate:—"This is to certify that we have this day carefully examined one KEANU, a Hawaian man in confinement at the Oahu Gaol, who was inoculated with leprosy by Dr. ARNING on Nov. 5th, 1885, and it is our decided opinion that this man is a tubercular leper."

One fact of this nature is worth more than any number of theories, and ought to suffice to convince any who are still sceptical on the point, that leprosy should be classed among the disorders liable to be contracted by contact.

The colony of British Guiana, as far as spending money is concerned, cannot be said to have been unmindful of its responsibility with regard to its leper community. Up to 1877 the Asylum was simply a disgrace to the colony, although large sums were annually voted for its maintenance; but since then a new system has been in existence, and to-day the Leper Asylums will compare favourably with any others. The present annual outlay is close on \$30,000, and recently a medical man has been appointed to take sole charge and devote all his time to their interests. Previously, the Medical Superintendent, in addition to his duties at the Asylum, had a large district with five estates' hospitals to look after, and frequently, for months at a time, to do the work of men at either side of him, and had only his spare moments to devote to investigations into the nature of leprosy. Now that is all changed; and we may therefore reasonably expect to have much more light thrown on this interesting and important affection. It goes without saying that the holder of such an important office

d be a scientific man, skilled in the use of the micro-

scope, a bacteriologist and histologist. The profession has not yet been placed in possession of any of the scientific work of the present Superintendent; but he has been too short a time in office. He may be assured of as hearty a reception of his work as that accorded to his colleague of the Trinidad Asylum.

The Asylums at Mahaica are at present very well conducted. The place is clean and comfortable, and the inmates receive every care and attention, and are well fed and clothed; but when we read in the report for last year that as many as 67—a larger number than in any previous year—absconded and returned to dwell among the sound inhabitants, we may well pause and enquire whether the colony is receiving full value for the large sums of money annually spent on these Asylums. If such care is taken of them and they receive every comfort, is it too much to ask in return that they should surrender their liberty and submit voluntarily to strict segregation, the only arrangement at all likely to stamp out the disease? For years the writer has been urging on the Government the necessity for strict isolation, if they wish to profit by the experience of Honolulu; but notwithstanding, matters are in the same position to-day as they were ten years ago. Nothing has been attempted, nothing done; and colonists continue to live on in a fool's paradise, apparently unconscious of the dangers by which they are surrounded. Many years ago, in one of my official reports, I suggested that all the West India Islands should combine and form one leper community on one of the Islands of the Caribbean Sea; but nothing came of the suggestion.

The present Asylums here have undoub-

good service, and are still capable of doing good, if only a different policy would be adopted. That known as the General Leper Asylum is practically isolated and within easy reach of supervision, a most necessary desideratum. The difficulty hitherto has been with the female lepers. They are most unmanageable; and their Asylum is most unsuitable in every way, and should not be so near the male Asylum as it is at present. It was this difficulty about the sexes that led to the riots at the Asylum some years ago.

One of the islands in the Demerara or Essequebo rivers, has been suggested as the future site to which all the lepers should be removed; and the suggestion deserves consideration. Our duty will not, however, have been done by merely sending them out of sight, that they might be, as doubtless they would be, out of mind. They must be placed within easy reach of proper Governmental supervision; and it will not be easy to get a medical man and officers willing to isolate themselves far away among such cases. A great many difficulties stand in the way, and a good case will have to be made out, and good plans submitted, before the Home Government will permit any change. Something will soon have to be done at the female Asylums, as the buildings there—intended to be temporary—are falling to pieces.

The West Indies will never stamp out leprosy unless they all combine seriously together, and form the large leper community, each place contributing its proper share of the cost. By these means, and by insisting on strict isolation, there is every human probability that the disease of leprosy may yet be entirely eradicated, as

England during the Middle Ages.

The Fight between the "Peacock" and the "Hornet," in 1813.

By N. Darnell Davis.

 HE year 1813 found Great Britain at war with the United States of America as well as with BONAPARTE. At that time Demerara and Essequibo, joined together as one colony, and Berbice as another colony, were in the possession of Great Britain. They had last been taken from the Dutch in 1803. Holland herself now formed part of France.

Major General HUGH LYLE CARMICHAEL, described as "a soldier from his cradle," was, in the early months of 1813, Acting-Governor of Demerara and Essequibo. In *General Orders* to the Militia, of the 1st of January, the Governor had thus alluded to the struggle with NAPOLEON:—

"Bonaparte's course of life and sanguinary foot-steps are easily traced for the last twenty years, and must be warm in the recollection of every person then capable of perception and now in existence

"The Russians having destroyed their ancient city of Moscow, in preference to the risk of its being violated by his army, proves sufficiently their opinion of Bonaparte's favours. With regard to his conduct after deserting his troops in Egypt, it is strongly marked by the multitude of human victims sacrificed to the ambition of an individual, assuming universal empire.

"The British, Spanish, and Portuguese powerful and successful opposition to t

evince what justice, supported by courage and energy, can accomplish.

* * * * *

"Should Bonaparte's legions, or satellites, of whatever nation they may be, make a hostile attempt, there is no doubt they will find the same spirit of loyalty, with arms and determination to support it, that the Americans experienced in their attack upon Canada."

The Governor concludes his *Orders* with the intimation that the Rev. Mr. STRAGHAN has very handsomely proposed to give a discourse to the Georgetown Militia, at the Parish Church, at two o'clock on the Sunday following, and notifies his intention of himself accompanying the Militia to church. In those days the Militia was embodied all over the colony. The Royal Militia of Georgetown especially, seems to have been a formidable body. Twice recently had they volunteered for service afloat to rid the coasts of the colony of American privateers. Early in February, the Governor had received from Earl BATHURST, Secretary of State, a despatch conveying the Prince Regent's approbation of the conduct of those of the inhabitants of Demerara who lately "so gallantly volunteered their services against the enemy."

On every side there were signs of war. American Privateers infested West Indian waters. Along the coast of what is now British Guiana they did a vast deal of damage. The *Highflyer*, the *Patriot*, the *Saucy Jack* and the *General Armstrong*, were amongst the most successful depredators. They, especially, wrought havoc

*"merchant ships sailing to and from Georgetown
"am. To rid the coasts of these pests,*

it was, that in September, and again in October, 1812, volunteers from the 60th Regiment and from the Royal Militia, had put to sea in an armed packet-boat and a merchant ship. It was not only off the coasts of the colony that the dangers of war awaited the trading ships. Vessels sailed from England and elsewhere for the colony, never to reach it, and so with vessels from the colony. They were captured at sea. As many of the merchant ships were armed, the enemy sometimes caught a Tartar. Not a few vessels had arrived in the Port of Georgetown, after having made it very hot for the foe.* One instance must suffice. The *Ramoncita* came in, early in the year, with news of a hard fight she had been engaged in, not far from Madeira, with an American ship, which was probably the privateer *America*. The enemy had given her name as the United States' ship of war *Hornet*. This did not frighten Captain VENABLES. Whatever her name, she was a more formidable vessel than the *Ramoncita*. By skilfully manœuvring his ship, and vigorously plying his guns, VENABLES succeeded in doing so much damage to the foe that she had to draw off. Among the *Ramoncita*'s passengers was Lieutenant PLAYTER of the first battalion of the Royal Militia. Placing himself at the head of those who played the part of marines on board

* After this manner does the *Royal Gazette* of the 9th of February, 1813. herald the fame of the triumphant merchant ships:—* * * "Scarce had we noticed the *Caldonia*'s 'glorious deeds,' when those of the *Maxwell* claimed publicity! —scarce had we told of *her*, the 'laurel'd tale,' than, too, the *Brigid*, with her 'gory sides,' but 'victor flag,' demanded our applause! —scarce had we stowed *her* name, and great exploits, than soon the *Ramoncita*'s 'feats of war,' we had to state! And now the *Cæsar*'s."

the vessel, this officer so greatly distinguished himself that, immediately upon his arrival in the colony General CARMICHAEL promoted him to be a Captain in the Militia.* One has only to con the shipping advertisements in the *Demerary and Essequebo Royal Gazette* of the 23rd February, 1813, to realize the conditions under which the colony's trade was carried on in a time of warfare. Here is a ship announced as *to sail with the first convoy in April*. She is described as being *well armed and manned*. Another *will positively sail with the first convoy that may offer*. A third, *mounting fourteen eighteen-pounders, with small arms, and men answerable*, will sail the first spring tides. A fourth is

* The record of Captain Playter's gallant conduct should be preserved for the encouragement of his successors in the Militia and Volunteers. The subjoined official notice is taken from *The Demerary and Essequebo Royal Gazette* of January the 5th, 1813:—

THE KING'S HOUSE, DEMERARY.

The following promotions to take place in the Demerary Militia:—

A report having been made to his Excellency the Acting Governor of the conduct of Lieutenant Playter of the Grenadiers of the First Battalion, having distinguished himself in a severe engagement with the enemy on board of the *Ramoncita*, Captain VENABLES, in which, highly to the credit of the Commander, and every person on board, a very superior force was defeated.

Lieutenant PLAYTER is promoted to the rank of Captain in the Militia, remaining (agreeable to his own wishes) in the Grenadiers, which company he will command in the absence of the senior Captain, ROBERTSON.

Lieutenant ALEXANDER GRANT to be Captain of the Artillery Company.

M. VIRET and JAMES A. ALBOUY, Gents, to be Lieutenants of Artillery.

By Command,

King's House, Georgetown,

JOHN EYRE,

January 5th, 1813.

A.D.C.

well armed and well manned, will take the benefit of convoy. A fifth, bolder than the rest, will sail *with or without convoy, being well armed and manned.* Above all, there is the Official *Notice* as to *convoys*, containing the latest arrangements made by Admiral Sir **FRANCIS LAFOREY** for protecting the ships going home from Demerara. It shall tell its own tale :—

THE KING'S HOUSE, DEMERARY.
NOTICE.

His Excellency the Acting-Governor has received a Letter, of which the following is an Extract, relative to the convoys for the present year :—

“ I have the honour to inform Your Excellency, for the information of the Planters and Merchants of the Colony under Your Excellency's government, that the convoys for the present year are arranged to sail from Demerara as follows :—

April at the Full Moon,
June at the Full Moon,
July at the Full Moon;

at which periods a vessel of War will call there, to take the trade from thence to the Island of Grenada, where it will wait to proceed with the Trade of that Island, to the place of general rendezvous.”

(Signed) **FRANCIS LAFOREY.**

The vessel told off to the service of convoying ships from Demerara to Grenada in January and February, 1813, was His Majesty's sloop of War *Peacock*, a brig rigged vessel, built of oak, of 386 tons, mounting eighteen 24-pounder guns, two long 9-pounders, and one 12-pounder as a shifting gun, and having a crew of 122 men. The commander of this vessel was Captain **WILLIAM PEAKE**, a son of Sir **HENRY PEAKE** who, from the 27th of June, 1806, to the 25th of February, 1822, was Surveyor of the Navy. Captain PEAKE had been seven years a Commander, and had come to the West Indies in search of promotion. He was a brave man, and had often fought the enemies of his country. He took great pride

in his vessel, everything being kept spick and span. As his first Lieutenant he had FREDERICK AUGUSTUS WRIGHT, a right gallant fellow. The second Lieutenant was C. LAMBERT. The Master of the Vessel was EDWARD LUTT, her Surgeon was J. WHITAKER, and F. D. UNWIN was Purser. She carried Midshipmen.

On the 15th of February the *Peacock* arrived from Barbados. She appears to have remained in the Demerara River until the 23rd or 24th, when she sailed on a cruise off the coast. As Captain PEAKE was a favourite with the colonists, it is likely that he and his officers were present at the deferred celebrations on the 18th in honour of Queen CHARLOTTE'S birthday.* One of the

* It may interest colonists of the present day to learn how a Queen's birthday was kept up in the early years of this century. The following account is taken from the *Royal Gazette* of the 20th of February, 1813—

"About ten o'clock, the Royal Battalion of the Militia, assembled at the respective places of roll-call; and, soon after, proceeded to the Grand Parade—where was already stationed, the 60th Regiment. "The united line being formed, the Commander in Chief began to be momentarily expected; when Major IMTHURN arrived, and announced His Excellency's sudden indisposition. At such a time, and on such a spot, intelligence so unexpected, must be supposed to operate not a little on the martial enthusiasm of the moment; the *post of honour*, however, devolving on the Garrison Commandant, Lieutenant-Colonel CODD, the business of the field commenced. One detachment of the Royal and Militia Artillery paraded with a field piece upon the right of the 60th, and another on the left. The salute commenced with seven guns from the right field piece; a *feu de joie* followed on the right of the 60th, and proceeded to the left of the Militia, when seven guns were fired from the left field piece. After this a *feu de joie* was fired from the left to the right; then seven guns from the right field piece, and another *feu de joie* as at first. "The troops then marched in review order and returned home. The review-station was crowded with Persons of Distinction.

officers may even have lost his heart at the birthday dance, as one of them was left behind when the *Peacock* went to sea. The colonists had hardly taken leave of that vessel, when His Majesty's sloop of war *Espiégle* commanded by Captain JOHN TAYLOR, anchored outside the bar of the Demerara, on her arrival from Europe. This vessel being in need of repairs, her crew were set to work to unrig her.

With all the stern reality of war at hand, the colonists had nevertheless not suffered from the extreme hardships of an invasion. Since Great Britain had taken possession in 1803, there had been no attack upon the colony. It is, moreover, in the nature of planters to endure a good deal when the price of produce rules high. In the Liverpool market on the 23rd of January, the price of sugar ranged from 80/- to 90/- the cwt.

that of coffee , , 65/- to 105/- ,

that of cotton , , 2/0½d. to 2/6 the pound.

that of rum averaged from 4/6 the gallon.

" At one the fort and shipping saluted as usual.

" About six in the evening, the previously formed *Vauxhallic* avenue " beginning at the bridge, and terminating nearly midway of Marshal's " hotel, was lighted up ; but unfortunately, the wind proved too high " throughout the evening, for any very brilliant effect. In the ball, card, " and supper rooms, as well as the front gallery, several appropriate " transparencies and illuminated devices were also placed. The com- " pany began to assemble at the usual hour ; the dancing commenced " about eight : and the only regret expressed, was the absence of His " Excellency. The Hon. W. ROBERTSON presided ; and under his " auspices, the night past away in the utmost harmony and conviviality. " After supper a number of loyal and popular toasts were given as " usual on such occasions."

Mr. EVERARD F. IM THURN, the civiliser of the North-West Territory of British Guiana, is a grandson of the officer of the like name who is mentioned above. Mr. IM THURN is well known to the scientific world for his varied attainments, and is an Ethnologist of high repute.

One would have thought, here, indeed, was the border-land of the colony's *Golden Age*, but this was not so. The *Good Old Times* must be looked for at a somewhat earlier period. Writing on the 20th of February, 1813, the cheery Editor of the *Royal Gazette* anticipates in his own way the good news by the next packet, tidings having reached Demerara of that vessel's arrival at Surinam, which place was then also in possession of Great Britain. The worthy old colonist seems himself to have known better days than those of which he writes so feelingly in the following strain :—

"The planter and merchant, we hope to gratify with a price current of colonial produce, rapidly advancing towards what was prevalent in Demerara's *good old days*—when *duns* were as scarce as *cash* at present; and the greatest *curiosity* that could be exhibited, was a *citation*."*

Without steam boats and the telegraph to aid in the distribution of news, the old time colonists were yet kept alive to what was going on in other parts of the world, by the king's packet ships, and by the numerous other sailing vessels coming to the colony. Sometimes the news came by way of Barbados or some other neighbouring colony; sometimes by a ship which had spoken another ship at sea. WELLINGTON'S victorious progress in the Peninsula makes many a page to glow,

* Was there a revival of the *good old times* in the year following? In January, 1814, in his issue of the 24th, the Editor of the *Royal Gazette* became quite enthusiastic over the cheering state of the produce markets. "Sugar, for ever!" he exclaims, and adds :—"We congratulate the planter of this species of produce, that it is said, by the latest communication from London, the *lowest* sum for any kind is 99s. We have seen a Glasgow price current in which fine was 100s."

in the early numbers of the *Royal Gazette*. Then, as now, news came sometimes, that was contradicted afterwards. It had often been reported that NAPOLEON was dead. On one occasion the *Royal Gazette* had set forth in large type a report of the capture of Commodore RODGERS, with the *President* and other vessels of the squadron, which had been sent to sea by the United States. That this latter statement did not prove true must have been very disappointing to the Colonial Editor, who had no hesitation in denouncing the President of the United States as "a *slave* worthy of his *master* 'BONAPARTE.'

Through the successes gained by her land and sea forces, in her struggle with NAPOLEON, Great Britain had not only become possessed of nearly all the Colonies of France and those of her allies, but had also cut off France from commerce with the outside world. One consequence of this, the building up of the beet-root industry, West Indians rue to this day.* The condition of France, bereft of her foreign trade, attracted the attention of the enterprising citizens of the young Republic of the United States. As neutrals, they were ready to trade with either France or Great Britain. They traded with both. The supplying of France did not, however, suit Great Britain, with her assured naval

* On the 18th of March 1808, NAPOLEON wrote to the distinguished chemist, BERTHOLLER, enquiring whether it were true that a man called ACHARD had made good sugar from maple, at Berlin. Was it true, also, he asked, that good sugar could be made from turnips. BERTHOLLER was required to enquire as to these matters.

In the early part of 1812, the French were so sorely put to it for want of sugar, that they had to relieve their feelings by caricaturing the Emperor's hobby for beet-root. A cartoon represented NAPOLEON

supremacy, and the relations of England and her eldest daughter became very quarrelsome. Moreover, the *Old Country* insisted upon her right to search American vessels for English sailors, and to take these to serve in English ships of war. Continuous application of this right of *Impressment* was the last straw. On the 18th of June, 1812, the United States declared war against Great Britain.

With the memory of Trafalgar and other great victories at sea still fresh with them, with many of the heroes of those fights still in their service, the English felt a very real contempt for what they called the Yankee cock-boats. The tiny navy with which the Americans essayed to do battle, against such English war vessels as could be spared from the waters of the Old World, was, however, a thoroughly efficient one. Stout ships, well manned, and well supplied with skilful and brave officers, and men practised frequently at the big guns, and marines who, in the backwoods, had been marksmen from their boyhood, were sent to sea, to uphold the honour of the star-spangled banner and to fly the flag of free trade and sailors' rights ! Such as they were, they in every way were in the condition in which ships of war

trying to sweeten his coffee with beet-root, and giving the little King of Rome a piece of beet-root, saying, "Suck, suck, my child, it is sugar."—*Bingham*.

The following conversation passed between the Emperor and the famous *CUVIER*:-

NAPOLEON :—*Faut-il introduire de sucre de betterave en France ?*

CUVIER :—*D'abord, sire, il faut songer à vos Colonies ?*

NAPOLEON :—*Faut-il avoir le sucre de betterave en France ?*

CUVIER :—*Mais, sire, il faut examiner.*

NAPOLEON :—*Bah ! je le demanderai à Berthollet.*"

should be when sent to sea. And soon Englishmen began to wonder at what was happening. On the 13th of August, 1812, the *Alert*, of 16 guns, was captured by Captain PORTER in the United States' frigate, *Essex*, of 32 guns. On the 19th of the same month the *Guerrière*, of 32 guns, was taken by Captain HULL, in the *Constitution*, of 44 guns. On the 18th of October the *Frolic*, of 18 guns, was taken by Captain JACOB JONES, in the *Wasp*. On the 25th of October, the *Macedonian*, of 38 guns, was taken by Captain DECATUR in the *United States* of 44 guns. Then, on the 29th of December, off St. Salvador, in Brazil, the *Java*, of 38 guns, was captured by Commodore BAINBRIDGE. This was not a bad beginning for an infant navy, in its struggle with the Mistress of the Seas, especially when, as was the case, but one American war-ship, the *Wasp*, had been, up to date, captured by the English. Little knowing against what odds their ships had fought : for the condition of some of them was worse than the disadvantage of fighting bigger ships, better armed and manned : people in England cried out against their brave officers. Accustomed to victory, they seemed to think that their officers could wrest it against any odds. As it was, the Americans had to burn the *Guerrière* and the *Java*, as soon as these were taken. The *Frolic* was recaptured and her Captain at the same time taken. The *Alert*, formerly a collier, was found unfit for a store ship, and was turned into a block-ship ; and the *Macedonian* alone was added to the navy of the United States. The young Republic's sailors had, however, established their *prestige*, and, although the odds had been on their side, it was now plain that descendants of Englishmen settled in the New World were not afraid

to fight their cousins of the Old Home. JOHN BULL had reason to be proud of his family.

The *Constitution* had suffered so much in her fight with the *Java*, that Commodore BAINBRIDGE found it necessary to return home, without delay, and sailed for the North on the 6th of January, 1813. The *Hornet* remained to cruise off the coast of Brazil in quest of British ships. She was a sloop of war, rigged as a ship, carried 20 guns, and was very strongly built. Her commander was JAMES LAWRENCE, of New Jersey, afterwards the brave captain of the *Chesapeake* in her famous fight with the *Shannon*. He had been one of the gallant band who had, in 1803, under DECATUR, destroyed the *Philadelphia*, and he had taken part in the bombardment of Tripoli. His First Lieutenant was JOHN TEMPLER SHUBRICK of South Carolina, one of four brave brothers who have all left a name in the naval history of the United States. SHUBRICK had been in the *Chesapeake* in her affair with the *Leopard* in 1807. He had also fought under HULL in the *Constitution*, when the *Guerrière* was captured, and under BAINBRIDGE in the same *Old Ironsides*, when the *Java* was taken. Lieutenant STEWART, DAVID CONNOR, of Pennsylvania, and JOHN THOMAS NEWTON, of Virginia, were the other lieutenants. BENJAMIN COOPER, of New Jersey, probably a relative of the author of *The Last of the Mohicans*, served as a midshipman. Disturbed by the appearance at St. Salvador of the British ship *Montague*, of 74 guns, the *Hornet* shifted her cruising ground. Near Pernambuco she captured the English armed merchantman, *Resolution*, of 10 guns, and took \$23,000 in specie in her. After cruising off Maranham, the *Hornet* ran

for Surinam. She cruised off that coast from the 15th to the 22nd of February without meeting a vessel, and then stood for Demerara. On the morning of the 24th a brig to leeward was sighted and chase given, but, finding his vessel running into shallow water *LAWRENCE* thought it well to haul off. In her chase of the brig the *Hornet* had got within sight of the Demerara bar, where the British sloop-of-war *Espiegle* was lying at anchor with her colours flying. At half-past three o'clock in the afternoon, when the *Hornet* was beating round Great Courabanna Bank, to get to the *Espiegle*, a strange sail was observed on the weather quarter bearing down for the *Hornet*. Although not made out, the *Hornet* had been seen from the *Espiegle*, and had continued in sight for nearly an hour, when she was observed to tack and stand to the south-east.

On the morning of the following day, the 24th, those on board the *Espiegle* noticed pieces of wreck floating by their ship. In the afternoon, Captain TAYLOR, who was ashore, was informed by Governor CARMICHAEL that news had come from Mahaica that the *Peacock* had been defeated by the *Hornet* the evening before; that Captain PEAKE had been killed; and that the *Peacock* had gone down off the Little Courabanna Creek. This was the tale which four seamen of the *Peacock* told, who had been picked up off Mahaica by a shore boat, after having with difficulty kept themselves afloat for six or seven hours in a boat shattered by the enemy's shot. They had got into the boat as the ship was sinking, and had so made their escape. One of the four men had his clothes stained with Captain PEAKE'S blood, having been at the helm as that brave officer, standing by, received his mortal wound. On the follow-

ing day, the *Espiegle*, all unfit as she was, put to sea in search of the *Hornet*.

The sail which had been edging down for the *Hornet* had hoisted English colours. She was the *Peacock*.

Shall the stripes and stars, or tricolor, in triumph sweep the sea
While the flag of Britain waves aloft, the fearless and the free?

Ten minutes afterwards, or about half-past four o'clock, they beat to quarters on board the *Hornet* and cleared the ship for action. In order to get the weather gauge, she was hauled close to the wind. At ten minutes after five she hoisted the stars and bars. The *Hornet* having tacked, the two ships of war now stood for one another. At 5·25, in passing each other, they exchanged broadsides within pistol shot. The *Peacock* now wore, and gave the enemy her starboard broadside. Then the *Hornet* bore up close on the starboard quarter, and kept up a deadly fire for fifteen minutes. Early in the action the *Peacock*'s master, LUTT, had fallen stunned. As he was being carried below, Captain PEAKE said, "Poor LUTT! I did not think that you would have been the first." But the master soon returned to his quarters, having merely been deprived of his senses for a time. All hands exerted themselves to the utmost, cheered on by their gallant captain. While, however, the shot from the English guns cut up the rigging of the *Hornet*, the latter's fire went smashing into the *Peacock*'s hull. And now fell that brave man Captain PEAKE, while encouraging his men to continue the fight. A 25-pounder shot passed through his breast. The man at the helm, splashed with his blood, sprang forward, took the dead Commander in his arms to carry him below, but was himself knocked down by a splinter. WRIGHT, the First Lieutenant, at

this time took charge of the *Peacock* and continued the fight most gallantly. With her rigging all cut away, with her Commander and five other men killed, and her master, one midshipman, the captain's clerk, the carpenter, and twenty-seven men wounded, and with five feet of water in the hold and the ship sinking, there was no duty remaining unfulfilled, and her brave company could only yield to the enemy. Anxious not to destroy life unnecessarily, Captain LAWRENCE exposed himself to the risk of being shot down in trying to ascertain whether the *Peacock* had yielded. He had not long to wait. At about ten minutes to six o'clock the English ensign, union down, appeared at her fore rigging. But a few minutes after, her main mast went by the board. Lieutenant SHUBRICK was now sent on board. He soon returned with Lieutenant WRIGHT, who reported that the *Peacock* had six feet of water in her hold, and was fast sinking. It was now dark. The *Hornet's* boats were at once sent off under Lieutenant CONNOR and Midshipman COOPER for the wounded. Then both ships were brought to an anchor. As the ship was now steadily settling down, every exertion was made to keep her afloat until her crew could be got off. Pumping and bailing proved useless. Her guns were thrown overboard. Such shot holes as could be got at were plugged. It was all in vain. When the wounded had been got out, there were eight feet of water in the ship's hold. Lieutenant CONNOR now hailed to the *Hornet* that the *Peacock* was sinking. Apparently, he was not heard, as no answer came. All on board now shifted for themselves. Many got into the boats, but, as the ship went down, she carried thirteen English and three Americans with her. The three Americans

perished, and nine of the English. Four of the English managed to gain the foretop, and were afterwards rescued by the *Hornet's* boats. The four men who had been picked up off Mahaica, and had borne the tale of defeat to the colony, had got into a much shattered boat which was hanging at the stern of the *Peacock*. They found great difficulty in keeping her afloat during the six or seven hours that passed before they were rescued. The *Peacock* sank off Little Courabanna Creek, about twenty-four miles, as the crow flies, from the bank off the Courabanna, where the *Hornet* had tacked in order to get the weather gauge of the *Peacock*.* During their manœuvres the two vessels had gone thus far to the south-east.

Most of the wounded men of the *Peacock* were very severely injured, and three of them died after being removed. The clothes and other property of the ship's company had gone down in the ship. Of the *Hornet's* crew but one man had been killed and two been wounded. Two others had been severely burnt by the explosion of a cartridge. The *Hornet's* foremast had a shot in it, and her bowsprit was slightly injured. Her rigging and sails were much cut, but her hull received little or no damage. Lieutenant STEWART was unable, from illness, to stand on deck, and

* *The Royal Gazette* of March 9th, 1813, says:—"The wreck of the *Peacock*, we find, is in seven fathoms water, off Little Courabanna."

In his *Naval History*, James says, Vol. VI., page 48:—"The wreck of the *Peacock* was visible for a long time after the action, and bore from Point Spirit, which is about six miles to the eastward of the entrance to Demerara River, north-east by east, distant six leagues; making the distance between the *Espiègle* and *Peacock*, during the action nearly twenty-four miles." Point Spirit is off Plantation Lusignan.

did not take part in the action. Either mistaking Little Courabanna, off which his ship now lay anchored, for Courabanna, whence he had seen both the *Espiègle* and the *Peacock*, or, in the excitement of the fight, not realizing that during the fight he had gone to the south-east more than twenty miles, Captain LAWRENCE was under the impression that the firing of the guns must have been heard by the *Espiègle*. Under this misapprehension, he expected to be instantly attacked. Every exertion was, therefore, used to get the *Hornet* ready for action. By nine o'clock the boats were stowed, a new set of sails were bent, and the ship was again in fighting trim. At 2 a.m., on the 25th, the anchor was weighed, and the *Hornet* stood by the wind to the northward and westward, on her homeward way. The pitiful state of the prisoners touched the crew of the *Hornet*. They subscribed among them for the *Peacock*'s men, two shirts, and a jacket and trousers for each. So kind were Captain LAWRENCE and his officers to their prisoners that, shortly after the *Hornet*'s return to the United States, Lieutenant WRIGHT and his brother officers addressed a handsome letter of acknowledgment to their captors. "We ceased to consider ourselves prisoners," they said, so considerately had they been treated when received on board. This goodness had been extended to the ship's company.

The appearance in Georgetown of the four sailors of the *Peacock* who had been rescued off Mahaica, brought home to colonists that they had indeed lost their naval protector. Captain PEAKE'S desk, with papers, and several other articles from the *Peacock* floated ashore between the Mahaica and the Demerara. The Governor

issued a notice, asking that any papers or small articles picked up should be sent to the King's House, and that boats, spars, and other materials belonging to the wreck should be lodged in Fort William Frederick, for the purpose of being secured in His Majesty's stores. A commemoration service was held in St. George's Church, Georgetown, on Sunday the 14th of March, when the Governor was present, attended by the Royal Battalion of Militia. An officer belonging to the *Peacock*, who had been left on shore when that vessel last put to sea, also attended the service. At the Governor's request, the Rev. W. G. STRAGHAN preached a sermon appropriate to the occasion. Before this, however, the colonists had given substantial proofs of their sorrow. A meeting of the inhabitants of Demerara and Essequibo was held at MARSH'S Hotel, Georgetown, on the 4th of March. The Honourable JOSEPH BEETE, the leading man in the colony, was voted to the chair, but, on his declining the honour, and at his particular desire it was taken by the Rev. Mr. STRAGHAN, The meeting resolved that a Marble Tablet should be erected in St. George's Church to Captain PEAKE'S memory; that Mrs. PEAKE should be presented, in whatever form might be most agreeable to herself, with some memorial of the inhabitants' gratitude, respect, and admiration of her gallant and much lamented husband, who had fallen in protecting their ships and commerce; and, that subscriptions should be raised for helping the widows and children of those of the crew who had fallen in the fight, and for the assisting of the wounded and disabled. Should enough money be raised, some was to be given to the officers and crew to repair

their present losses. The Honourable JOSEPH BEETE was appointed Treasurer, and the following were appointed a Committee to give effect to the resolutions and to collect subscriptions:—

The Hon'ble. J. S. MASSE.
" PETER GRANT.
" JOSEPH BEETE.

ALEXANDER FULLERTON.
ANGUS FRASER.
JAMES SIMSON.
CHARLES BEAN.
M. VAN KERKWIJK
J. H. BOODE.

The Hon'ble. JOHN WILSON.
" WILLIAM AUSTIN.

STEPHEN CRAMER.
THOMAS DOUGAN.
CHARLES RUTHERFORD.
WILLIAM MUNROE.
PETER McGARREL.
HENRY FROST.

Subscriptions flowed in. By the 20th of July, after paying sundry accounts in the colony, including disbursements for the rescued seamen, and for "Mr. SIDELL," who may have been the officer left behind, the Treasurer was able to remit to England about £1,570. The subscriptions were made in guilders, and, in remitting, 12 guilders and 10 stivers were reckoned to the pound sterling. The names of the subscribers include many which are familiar even now: such as GEORGE BUCHANAN, THOMAS FRANKLAND, A. FULLERTON, ROBERT KINGSTON, ROSE and CROAL, Dr. JOHN AUSTIN, S. BUTTS, H. HYNDMAN, JOHN HOPKINSON, JOHN JONES, ALEXANDER PITMAN, JAMES ROBERTSON, JOHN HANCOCK, R. IRVINE, H. JUNOR, the Honourable THOMAS MCARTHUR, S. O. NURSE, J. H. ALBUOY, P. BENJAMIN Dr. R. JONES, POLLARD & CO., G. B. PORTER, JAMES STEWART and E. HIGGINS. A further sum was later on remitted, making, in all, about £1,600. In the first week of June in 1815, the tablet was put up in St. George's Church. At the same time there was also erected a monument to the memory of Governor

HUGH LYLE CARMICHAEL, whose death had taken place meanwhile, to the sorrow of the inhabitants.

On the 25th of February, 1813, the day after the fight between the *Hornet* and the *Peacock*, the United States frigate *Chesapeake*, on a cruise, passed over the spot where the action had taken place. After cruising off Barbados and Antigua, Captain EVANS, her Commander, steered homewards, and, on the 18th of April, arrived at Boston. On the 1st of June, the *Chesapeake*, now commanded by Captain JAMES LAWRENCE, lately of the *Hornet* sailed forth from Boston to fight the British frigate *Shannon* commanded by Captain BROKE.

The result of the furious fight, which then took place between these two fine ships, captained by two most gallant commanders, is well known. As the brave LAWRENCE was being carried below, on receiving the wound of which he died within a few days, he called out to his men, *Don't give up the ship!* The *Chesapeake* was carried into Halifax, on the 6th of June, by Lieutenant FALKNER, third of the *Shannon*, and Captain LAWRENCE having died on board her on the 4th, his body was taken ashore and buried with full military honours. First Lieutenant WATT of the *Shannon* being killed, and the heroic Captain BROKE being disabled by his wounds, to Second Lieutenant WALLIS, himself a Nova Scotian by birth, fell the proud honour of carrying the victorious *Shannon* into Halifax. And now, when six and seventy years have gone by, that Lieutenant WALLIS yet lives, and, as Sir PROVO WILLIAM PARRY WALLIS, G.C.B.,

is, in his ninety-ninth year, Admiral of the Fleet in the Royal Navy.

To Mr. THOMAS WATT, the proprietor of the *Royal Gazette* newspaper, the writer of the foregoing paper is very much indebted for the loan of old files of that Journal. These have supplied many of the details given above.

Along the Essequibo and Potaro.

By the Editor.

EARLY in March, an unexpected opportunity of a month's collecting trip offered itself, and the Essequibo and the Lower Potaro were selected as the districts to be visited—the former, through the probability of procuring large animals of their kind, more especially reptiles and fish, such as the cayman and laulau; and the latter, as a more zoologically unknown district.

Starting from Georgetown on the 7th by the steamer for Bartica, we made arrangements for a boat and crew, with a special captain and bowman, to be ready to start early on Monday, the 11th, from the Grove; and in the meantime ascended the Mazaruni to the Marshall Falls. Little of interest, however, was obtained, the most desirable specimen being a fine male of one of the red-backed hangnests (*Cassicus affinis*). In the forest, behind the Indian settlements above St. Edward's, bell-birds (*Chasmorhynchus niveus*) seemed to be plentiful; but they were difficult to find, being perched high up out of range on the topmost branches of huge trees.

On the Monday morning just before getting ready to start, we fortunately discovered that the keel of the boat that was most suitable for our journey, had been badly damaged in one of the cataracts, on the way down from the Puruni, a few days previously; and, as the damage had not been reported by the captain, we were now delayed for more than a day, while a new plank was put

in. Early on Tuesday, we got off in our one large bateau, with a crew of twelve men, made up of SCHOMBURGK, the captain, and his son, and of five river men and five Indians. Owing to the difficulty of handling a large boat in the cataracts and rapids, and the impossibility of our boat being portaged by the men past the great falls below the Kaieteur, it would have been advisable to have taken a couple of smaller bateaux; but as these would by no means have been so suitable for our special work, while the expense of an extra captain and bowman would have been a considerable item, all idea of visiting the Kaieteur was put aside, unless the chance of a corial or woodskin offered itself later on when the neighbourhood was reached.

Settlements of various sizes are to be found along the river above Bartica Grove, of which Agatash and St. Mary's Mission, may be particularly mentioned; and these settlements, prettily and advantageously situated on the rising ground and embosomed by the forest, present a most inviting appearance. With such settlements before one's eyes, one cannot help wondering whether a more liberal land policy—under which free grants should be made, under special conditions of occupation and cultivation, of the land now lying useless and undeveloped, and beyond the confines of civilisation—might not tend materially to the advancement of the colony.

About twenty miles above Bartica Grove, and about five miles above the mouth of the Morabally Creek, where there is a large wood-cutting grant with a fine house most beautifully situated, the granitic bars, causing the various rapids which render the river unnavigable, begin to appear. Below this point, the

water is studded with masses of rocks, of all shapes and sizes, indicating the approach to the first rapids of Aretaka; while above, at varying distances apart, the rapids extend for about fifteen miles, after which smooth water is reached, extending, with scarcely any interruption, nearly to the mouth of the Potaro, some sixty miles distant.

During the greater part of the second and third days we were toiling among these rapids, pulling the boats over in the customary manner by means of ropes, the men standing in the water or on the rocks above the rapid, as occasion offered; unless, owing to the slightness of the obstruction, it was possible to paddle through—though, even then, only at a tremendous expenditure of force, against an apparently slight current. Marihi, formed by one great tumble of water over a mass of granite, where the Rev. Mr. Pearce and his family (one little boy excepted) were drowned some years ago while descending, seems to be the most dreaded of these rapids; though Waybrook and Itabally are the most wearisome, since they consist of a long series of small and closely placed rapids, extending for some miles towards the upper end of the set.

All along this part of the river the scenery is extremely beautiful; and the traveller has spread before his eyes an ever changing picture. Islands of all shapes and sizes, from the barren and often fantastically shaped rock, at times capped by a single shrub or tree, to the large and well wooded areas of several miles extent, stud the course, hiding the true banks of the river; while granite blocks, often intertwined with gneissic pieces, washed and worn into rounded masses by the

action of water, and covered by a black or coppery-brown layer, rise at all points, the effect being heightened considerably by the contrast with numerous masses of golden yellow sand. Such, at any rate, is the bright picture afforded in the dry season; and while, in the rainy season, the rush of water at the rapids must be markedly more grand, the general variety of scenery must be correspondingly monotonous, where the water stretches, nearly unbroken, from the dense forest line on the one bank to that on the other.

In the neighbourhood of the rapids, animal life was not all obtrusive, though, as touching birds and insects, fairly varied in its character. Of birds, blue and white cranes (*Ardea cocoi* and *A. egretta*) were frequently seen singly by the waterside, together with the bronzed ibis or bush curry-curry (*Harpiprion cayennensis*) and the muscovy duck (*Cairina moschata*), which more usually rose from among the matted roots where there was a muddy deposit. On the overhanging boughs or bare stems, species of kingfishers (*Ceryle*) perched, and occasionally also a ducklar or darter (*Plotus anhinga*), twisting its long and snake-like neck in all directions, but never awaiting our near approach—a marked contrast to the white-backed or swallow-winged barbet (*Chelidoptera tenebrosa*), which rested at ease on the topmost twigs of the dead trees scattered along the banks. The large black bunya (*Ostiumops decumanus*) and the yellow-backed mocking bird (*Cassicus persicus*) flew from island to island in numbers, uttering their hoarse cries, or jumped about restlessly among the high trees, where their long and pendent nests swung from the ends of the branches; while among the little islands by the rapids, the hand-

some fall-bird (*Paroaria gularis*) darted like an arrow from thicket to thicket, its blood-red head gleaming in the sunshine. Various species of macaws, parrots, gulls, and swallows, together with the ubiquitous black-headed and red-headed carrion crows (*Cathartes atrata* and *C. aura*) and the common "qu'est-ce-qu'ildit" (*Pitangus sulphuratus*) were also to be seen; but the chances of procuring specimens seldom came.

Of insects, the common "blues" (*Morpho menelaus* and *M. achilles*), the green dido (*Cethosia dido*), the common "yellows" (*Callidryas*), the black and green tailed moth (*Urania leilus*), and the common speckled *Anartia* (*A. jatrophæ*)—perhaps the commonest butterfly in the colony—were most frequently noticed, generally among the bushes along the banks.

At Gluck Island—a long and narrow island above the last rapids at Ahara—where for the first time nearly all travellers in Guiana see the *Victoria regia* growing in its native home, we stopped in order to make our way to the large pond at the southern end where the plant grows, guarded by a dense thicket of the prickly Souari palms (*Astrocaryum*) but owing to the extremely dry weather, the pond had disappeared, and a long soft grass covered nearly the whole extent of soft mud, except at one central part whence some hundred or more hassars (*Callichthys*) were taken, from a deep puddle about a foot square. The lily was entirely dried up, only the impression of the large leaves on the mud and a few of the fibrous veins and stalks remaining. Small grasshoppers, and species of hairtails and other small butterflies—chiefly *Anartia*—swarmed among the long grass, but it was almost impossible to obtain them owing to the

soft footing in the mud ; while the prickly palms afforded ample protection to the large black bunya birds and the common spurwings (*Parra jacana*) which took refuge among them.

Though disappointed at Gluck Island, we were fortunate in finding the lily growing and flowering luxuriantly, but densely crowded, with recurved leaves, in a smaller pond in Cutuabanaboo Island, a few miles above the mouth of the Tipuri river. Quite by chance I came upon the pond, while wandering in the forest with my gun, seeking specimens, as was my habit wherever we camped ; and it seems to me by no means unlikely that the other large islands possess corresponding ponds in which the lily may be growing.

The pond at Cutuabanaboo, which is a deep one, with steep sides, is about fifty yards from the water side, and is surrounded with tall forest trees, and, here and there, clumps of Souari palms. Owing to its secluded nature, it is the haunt of numerous birds, such as muscovy ducks, bitterns (*Tigrisoma*), herons (*Ardea*), spurwings, killacows (*Aramides*), etc., the cries of several of which, more particularly the killacows, blending with the hoarse "cronk, cronk," of various tree-frogs, woke the echoes of the place after sunset. The pi-pi-yo or greenheart birds (*Lathria cinerea*) swarmed in the surrounding forest, and kept up an almost deafening noise when disturbed by the report of the gun. As indicated by the size and the perfect freshness of the track, an immense jaguar (*Felis onca*) must have been disturbed at its evening drink by our approach, and it seemed likely that the pi-pi-yo birds had been excited by the ascent of the brute into one of

the trees close by; but an eager search with some of the Indians yielded nothing.

At the landing place here, our first perai (*Serrasalmo niger*) was caught on a hook. The throw had scarcely been made, ere the voracious fish had taken the bait, and had been landed grunting and fiercely snapping its terrible jaws; and doubtless it had been attracted by the smell of a wounded cayman (*Alligator niger*) which was suspended from the stern of the boat, but quite out of reach, above the water. This common species of perai, apparently the most widely distributed in the colony, with fiery reddish eyes and silvery sides, and with a prevailing bluish-black tint over the rest of the body, was the only one obtained on the trip, the largest individuals attaining a length of about 12 to 16 inches. Its skin was a most welcome one for the collection, since, hitherto, it had been absent from the Museum set.

The perais (*Serrasalmo*) are, in many features, closely related to the salmon of the north temperate regions, with which they were formerly classed; but they are rendered very different in shape owing to the peculiar flattening of the body from side to side, which renders it very deep from front to back. The toothed or saw-like ventral line, from which the technical name has been taken, renders them also easily distinguishable. Their voracity, accompanied by a formidable armature of sharp triangular teeth, set in strong, thick jaws, has given them a wide reputation for villainous biting, and one which is easily understood when a fair specimen of their excising power is under observation.

The family of fresh-water fishes, the *Characnidæ*, to which the perai belongs, is peculiarly rich in species, and

attains its greatest development in this region (Neotropical). It includes, besides, such widely divergent forms as the common haimara (*Macrodon*), the hoorie (*Erythrinus*), the krumai (*Brycon*), the biara (*Hydrolycus*), the daree (*Leporinus*), the cartabac (*Tetragonopterus*), and the pacu (*Myletes*). The greater number possess the soft and fatty dorsal, or "adipose," fin in front of the tail; while the swim-bladder is always transversely divided. This family replaces that of the carps (*Cyprinidæ*) in this part of the world; and it has affinities with the carps, the salmons and the herrings.

Late in the afternoon, before camping at Cutuabanaboo island, a young cayman, between four and five feet in length, was shot on the bank; and, as it was to be reserved for skinning till the following morning, it was slung up to the stern of the boat in a comatose condition, from which, however, it partially awoke during the night, and made frantic noises in its attempts to escape. The term "cayman," or "caiman," as used in the colony, applies only to the large species of alligators, the common large black cayman of the Essequebo being the *Alligator niger*. This species seems to reach an extraordinary size, since WATERTON has recorded the fact that he saw one thirty feet in length in that river.*

Apart from its great size, the species may be distinguished by its black skin, obscurely spotted with white, and by the possession of two small frontal ridges, evenly dividing the interorbital space. Unfortunately, the term *Caiman* has been applied technically to include those alligators in which a frontal ridge is altogether absent,

* WATERTON, *Essays on Natural History*, Second Series, p. 52.

while *Champs* has been given to those in which such a ridge is found; so that a certain amount of confusion is attached to the subject.

These reptiles are said to be extremely plentiful in the higher parts of the river above Ouropocari, but in the lower parts, they are but seldom met with; and although we saw them in the water, and on the sandbanks occasionally, in the distance, the young specimen shot on the dry land was the only one obtainable.

Early on Friday morning, we came in sight of Arrisaro mountain, situated on the eastern or right bank, and rising to a height of more than 700 feet above the sea-level; but it was not till late in the afternoon that we reached it and camped on the sand, on the left bank, facing the mountain. A great part of the morning was spent in hunting, and in skinning the specimens obtained, and among them a fine collared peccary or abouyah (*Dicotyles torquatus*) that was shot by one of the Indian huntsmen—a most welcome addition to our collection, giving a chance for the renewal of the faded specimen which had done duty for a very long time in the Museum, as well as affording a supply of fresh meat. The peccaries, of which there are only two species, are a peculiarly interesting type of the ungulate animals, and are the only American representatives of the great group of the pigs (*Suidae*). They are characteristic of the Neotropical region, though ranging into the Nearctic, to the southern parts of the United States. They differ from the other pigs, chiefly, in possessing only four instead of six upper incisor teeth, in being destitute of a tail, and of the fourth supplemental hind toe; while they are furnished with a peculiar dorsal gland, opening on the

hinder part of the back, and containing a liquid of a strong and disagreeable odour.

Immediately after camping, the Indian huntsmen were sent out, but they brought back only a large maam (*Tinamus subcristatus*). The late part of the afternoon was always, throughout the trip, devoted to hunting in the bush for specimens to be prepared ; and, almost invariably, the early morning also before starting ; and, sometimes, later on when a halt was made for breakfast. Generally, something was brought in desirable for the collection of skins ; but the Indian mind was more deeply bent on procuring " meat," and in spite of the repeated directions given to them when they set out, to bring in specimens of certain kinds, accourie (*Dasyprocta aguti*) and large maam were at first the almost constant result, varied at times by one or more specimens of other animals, among which the land tortoise (*Testudo tabulata*) frequently figured.

Fishing was also vigorously prosecuted at special camping places well-known to the men. Night after night, the long lines were set for the larger kinds of fish, skins of which I was particularly anxious to procure ; but seldom did anything result. An effective method of procuring bait was made use of in throwing pellets of counami leaves (*Clibadium*) into the water. After a short time, the various small fish, which had swallowed them, floated—often struggling under the influence of the poison—and were picked up by the men who pursued them swimming. " Daree" (*Leporinus*), a fish about a foot in length, and looking very much like a salmon, was almost invariably the bait thus caught.

The scenery of the river above the rapids was by no

means uninteresting. Great banks of yellow sand lay bare in all directions, contrasting powerfully with the frequent huge bars or dykes of dark granite and greenstone (diorite) which, at times, stretched nearly completely across the bed, with small deep channels through which the water poured, while, at other times they survived but as small tree-clad islands. The loamy and clayey banks rose steeply from about 10 to 20 feet; and the green line of the forest was frequently relieved by the glimpses of higher land, in the distance, seen across the wide reach of the river. Of flowering plants, however, there was a marked paucity; though the varied foliage of many of the forest trees, and chiefly the young reddish leaves of the *mora* (*Mora excelsa*), tended to produce a floral effect.

It was at Arrisaro, however, that the scenery of the lower part of the river first stamped itself upon my mind, for the position of the camp was, in many respects, an ideal one. In front lay the wide river, shut in, like a pond, at the sides, by two lines of dark, water-worn dikes of granite, and blocked in the distance by a bank of golden-yellow sand, over which towered the huge forest trees on the high bank; while, in the immediate background, rose, abruptly, the steep forest-clad mountain of Arrisaro—so steeply, that the tall white trunks of the forest trees were frequently unhidden, conspicuous against the prevailing dark green foliage. Seen in the evening, with the direct rays of the setting sun illuminating the face of the mountain, and casting most vivid reflections in the water, the view is indeed beautiful, though one scarcely realises that the height of the mountain is more than 700 feet. In the early morning, especially, while the light fleecy clouds lie like a thin veil upon the

top, the scene yields almost a complete satisfaction to the artistic elements of one's nature, and one feasts upon it more fully, perhaps, owing to the starvation from which one necessarily suffers on the coast.

One could not but be struck with the fact, that, on Arrisaro, there lies unoccupied a splendid site for the much needed Sanitarium or health resort of the colony, where, not only the jaded from the coast might rest and recuperate, but where the hale and hearty would find a welcome change from the flat coast, and be brought within easy reach of some of the most interesting parts of the interior. By the cutting of a canal between the Demerara and the Essequebo, or, as appears more likely to be done, along the banks of the latter river past the rapids, the mountain could be brought within easy reach of Georgetown, since, for the journey along the river, steam launches of light draught could be brought into service. From the abutment of the mountain on the very bank of the river, the road to be cut therefrom would be but a trivial matter; while a comparatively small clearing on the top of the sharp escarpment, facing the river, would throw into full and uninterrupted view, the greater and most interesting part of the marvellous panorama of scenery around. With a primitive settlement founded on such an elevated and salubrious site, and with the peculiarly striking natural advantages which it would possess, who can tell, but that in the near future, a fair city of health, set in its own flourishing gardens and farms, might crown the height of Arrisaro?

At Curro-curro lake—a wide expanse of water at the mouth of a creek on the left bank, separated

from the river by a high ridge, but leading into it by a narrow entrance through the bush—we were successful in procuring some fine specimens, among them being a female "baboon" or howling monkey (*Mycetes seniculus*), a warracaba bird or trumpeter (*Psophia crepitans*), and some lizards, molluscs, and insects. In the lake, into which boats can pass when the river is full, the arapaima (*Arapaima gigas*)—the largest of the fresh water Teleostean fishes, growing to the immense length of fifteen feet, and closely related to the herrings—is said to be found; but they are only obtainable by shooting them with the bow and arrow, from a boat launched on the lake. In the river, close by, a fine ducklar was shot. The birds were so shy that the only chance of procuring them was by resting the boat some distance away, and sending an Indian to steal on them through the forest.

Soon after leaving Curro-curro, a fine view was obtained of Yaya mountain, an inconsiderable elevation on the right bank, and stretching far way in the background; and in the afternoon, soon after passing Cumparu, where there is an Indian track leading across to the Demerara river, a camp was made at Shipariparu (*i.e.*, "sting-ray water") on the right bank, close to an immense dyke of green-stone which stretches across the river, within sight of Oumiah mountain, in the distance, on the left bank. Here, red-billed barbets (*Monasa atra*) are extremely common and easily procured; and a labba (*Cælogenys paca*) and an adoorie (*Dasyprocta acuchy*) were caught during the evening, but so damaged by the dogs as to be rendered quite unfit for skinning. An immense cayman was seen floating in a bay in the distance, but there was no chance of procuring it.

The next day, Sunday—days which by special request were set apart for rest—was spent at this same camping place; and it was amusing to study during these days the various occupations of the men—among which elaborate cooking, and washing and mending of clothes, formed the chief features. The making and baking of “bulls” (an immense flat cake, made of flour and water, and salt pork chopped into small pieces, and sufficient to satisfy the hunger of at least six or seven men) was the most serious item, and one requiring a considerable amount of time—the baking being performed in the hot fine sand and embers, over which a large fire had been made.

Not far above Shipariparu, Oumiah mountain on the left bank comes into full view, and a few small rapids are encountered, ere the mouth of the Potaro is reached. Below the rapids, a very fine specimen of the rare and curious, freshwater, matamata tortoise (*Chelys matamata*) was shot by the captain with the bow and arrow, and several other animals were obtained while hunting. The *matamata* presents a most grotesque appearance; for its carapace is covered with conical projections, and its non-retractile neck and head are furnished with curious warts and bristly bunches, the head being broad and flattened, and produced into a pointed beak.

On Smith's island, at a short distance below the mouth of the Potaro, is to be found the site of an old Dutch post—Smith's Post, as it is termed. Here the track of the cayman led in every direction across the sand and into the bush, and as it was said to be their season for laying, close search was made for nests, but without success.

Early on Tuesday morning, we entered the mouth of the Potaro, and found that the water here, as in the

Essequebo, was unusually low, rendering our travelling tedious in the extreme. In the Essequebo, in particular, sandbanks ran in nearly every direction, up and across the river; and we spent hour after hour crossing and recrossing at intervals, following channels that would allow a passage for the boat, during which times but little progress could be made. Nor, indeed, could the collection of specimens prosper, since two or three species of swallows, gulls, and sand-pipers, were the only denizens of these sand reaches.

At Tumamatami, where, about eight miles up the Potaro, a great dyke of greenstone runs across the river, forming a cataract of about twenty feet in height, the view is, as all lovers of nature who visit it must experience, almost a perfect vision of delight. The river, broken up into two chief channels by a tree-clad rocky island, tumbles, almost precipitously on the conspicuous northern side, down a rough mass of dark rocks, curtained at either extremity by the great arch of the forest, rising higher in the background; while the immediate foreground of still water, flanked by banks of golden sand at the edge of the forest, is surmounted by a perfectly picturesque grouping of sand below, and rock and tree above, opening out into a deep valley on the southern side. Small clumps of narrow-leaved shrubs densely covered with white and pink bloom, and dotted here and there among the bare rocks, gave an additional charm to the picture.

Here, for the first time, pacu (*Myletes asterias*) were obtained, a large female being shot by SCHOMBURGK, the captain, who was most expert with the bow and arrow—evidently to the surprise of a Partamona Indian, who

contemptuously remarked to him as he started:—“Buckra no able shoot pacu!” A dead specimen of the krumai (*Brycon macrolepidotus*)—a relative of the perai and pacu, of lovely colouring, and remarkable for the enormous size of its pale green and blue, silvery scales—was picked up, but it was, unfortunately, so badly bitten as to be unfit for preservation. The electric eel (*Gymnotus electricus*) was said to be common below the cataract, and one man indeed declared he had received a discharge while pushing the boat; but there was no other evidence of their presence.

Nearly a day was spent at Tumatamari carrying the goods across, and pulling the bateau up the south channel, where, from the lowness of the water, a track had to be made among the smaller rocks, and skids placed over the large boulders, in order to get the boat over.

Among the trees and rocks at this cataract, a large variety of orchids could be collected; we noticed, however, but few in flower; and those observed were by no means showy, but generally inconspicuous. One rather conspicuous form, (*Epidendron nocturnum*), with nearly white flowers grew in abundance on the trees on the island in the cataract. Many of the old trunks were literally covered with a green mantle of this species of *Epidendron*, and a common species of *Brassavola*, among which were frequent tufts of wild pines, and a small fern with long and narrow fronds (*Acrostichum simplex*). One common orchid (*Brassia*) with very fleshy pseudo-bulbs grew in large masses on the island in the cataract, even on the bare exposed rock, where the temperature under the hot sun seemed to be extremely prejudicial to its growth. The flowering season for plants generally was over, and but

for occasional small clumps of *hackia* (*Tecoma*) covered with its deep yellow bloom, of "kaieta" (*Gustavia*) with its large white flowers, or of the deep blue spikes of the *Petræa*, the hue of the forest along the river was almost unbroken, save where a creeper lay spread from tree to tree with masses of pink foliage, or some forest tree with young and coloured leaves appeared.

A few miles above Tumamatamari, a very peculiar alligator, of between four and five feet in length, was shot. The species has no frontal ridge, and much the general character of *Alligator palpebrosus*, but the head is considerably more elongated and attenuated, while its dorsal plates are not serially but irregularly placed. A yellow-coloured specimen, having much the appearance of *Alligator punctulatus*, was also seen; but it threw itself into the water ere a shot could be fired. Here too, for the first time, a sun-bittern (*Eurypyga helias*) was seen flying along the bank; and late in the evening, the deep roar of a jaguar was heard at some short distance from the camp.

Before reaching the mouth of the Curiebrong river, a large three-toed sloth (*Bradypus tridactylus*), a male with the conspicuous orange patch on its back, was noticed climbing slowly high up among a mass of creepers, and, after a considerable amount of trouble, dislodged. A large Ackawoi settlement, Wiaparipie, is met with just below the mouth of this river, and here we rested for a short time and went aback. Nearly all the people were absent, however, attending a large paiwarri feast—much to the disappointment of the crew, who had expected copious draughts of casiri.

Up to this point, but very few settlements had been

met with since leaving Morabally. At Aretaka rapids, we had passed a small settlement of two houses, prettily situated on an island, and known as "The Croft," where some "river people" lived; and at the southern end of Cutuabanaboo island, an Ackawoi settlement of a few houses had been observed. Higher up, close to the mouth of the Dahalibani river, and again close to the Curro-curro lake, small parties of Indians had been observed in the distance, but no houses had been seen, nor had any communications with the people been made.

On Thursday, March 21st, we reached the Potaro mission, beautifully situated by the rapids of Ichowrah, and here we settled down for the night, being most kindly treated by the Rev. Mr. QUICK, who had but just returned from the coast. Through his kindness in placing his small bateau and his corial at my disposal, a visit to the Kaieteur became possible; and, after leaving our surplus stores and the dried skins at the mission, we started next morning for the great falls.

From Ichowrah upwards, the river is crossed by a constant succession of rapids, cataracts and falls, which render the scenery particularly striking. A marked feature of the rocks laid bare, is their sharp-edged and pinnacled form, characteristic of the quartz-porphyry, which along the lower Potaro replaces the granite met with in the Essequibo. Ichowrah, Mowraseenia, Cabanatout, and Auritout, presented no serious difficulties, though at Cabanatout, owing to the height of some closely placed rapids, the boats had to be unloaded and hauled overland for about a quarter of a mile. At Pacoutout, where the portage is a difficult one, more than half a mile in length, and up and down a fairly steep hill, only the

bateau was portaged, the corial being taken up by water, though with very considerable difficulty.

At Pacoutout, some of the most lovely of the marvellous scenery of the Potaro is met with. For nearly a mile, the river is broken up by rocky islands of various sizes, more or less well wooded, into a series of channels, along each of which rapids, cataracts, and falls are encountered at but short distances apart. When the river is low, one is able to pass from channel to channel by a judicious combination of wading and jumping; and in this way, only, can an accurate idea be formed of the whole wide extent of falls, glimpses of parts of which can be obtained at intervals between the islands and scattered bushes, where the cataracts appear shooting over an altogether irregular grouping of broken terraces, seen against the dense forest on the hills in the background. Following the curves on the northern bank along the edge of the forest, instead of the uninteresting portage path, and ascending the hill into the bush only when absolutely compelled to do so, one is amply rewarded for the extra exertion and rough walking by the views obtained: on the one hand, tree-clad and rocky islets, often with great masses of water foaming and tossing between and about them, with a white spray rising like smoke from the cataract; and on the other, stretches of smooth dark water, brilliant with the reflected hues of the trees, and more beautiful still, when, like a land-locked bay, the water lies sheltered within a deep amphitheatre of forest.

Within the small rock-pools on the large rocks by the edge of the forest, and where they are exposed for a short time to direct sunlight, hundreds upon hundreds

of small tadpoles, apparently of two or three species, were to be seen, some just emerging from the egg membranes, while others were somewhat advanced in development; and in some of the pools, eggs alone were found in great clusters at the bottom. These deep little pools were certainly safe places for the early development of the little creatures, whose existence in the river, would be extremely precarious owing to the enormous number of fishes that must prey upon them.

Here too, between the rocks in the sheltered nooks, some most curious long-legged spiders were to be found, with red and extremely small bodies, which were but little swellings at the meeting point of the very long and thin legs, the third pair of which was of a bright red colour. Their normal number of limbs was seldom present; and it was surprising how quickly they dropped them if held, and made off with but two or three on each side. Without either a fine net or a killing bottle, it was almost impossible to procure a specimen undamaged as to its limbs. A most curious habit of the spiders was noticed when their webs were touched, for then they rotated their bodies with such a rapid motion that it was almost impossible to distinguish more than a rapidly shaken web.

At the last of the series of cataracts, a splendid male pacu was shot by the captain, and this, with the female obtained at Tumatamari, made up a pair of very fine skins for the collection, while its delicious flesh was a most agreeable change from the tinned foods. In the males, the anal fin is shorter, and the width of the body less than in the females; and the anterior part of the body is marked with black and brilliant red spots. When

seen in the water, the pacu appears of a deep uniform red colour, but, when taken out, the colouring is a dull brownish purple, on which the red spots of the male are extremely conspicuous. In shape they are much like a large and thick oblong-bodied perai, but they have teeth quite unlike those of the perai, being destitute of the lateral cusps.

Several specimens of different groups were obtained at Pacoutout, and among them a large ring-tailed monkey (*Cebus*). In the forest, too, for the only time throughout the whole trip, snakes were met with. My assistant came upon two, close to an old stump, one of which, according to his account, darted towards him, but received on the way the contents of his gun. The head was almost entirely shot away, sufficient of it being left, however, to prove that the animal was an innocuous one, though with elongated and curved maxillary teeth at the back of the upper jaw, which, to one with an insufficient knowledge, would have been—and, perhaps, excusably so—proof positive of the venomous nature of the creature, as indeed they had been to my assistant.

This snake, with much of the general shape of the yellow tail (*Spilotes corais*), was of a yellowish white below and a dull leaden-blue above, which, in the sunlight, gleamed literally with all the colours of the rainbow, especially at different points dependent upon the curvature of the body in certain directions. From what was left of the body, it seemed to be very similar to, if not identical with, a rare Colubrid, which has the peculiar characteristic of inflating its body to a large size when irritated, and at the same time flattening out its anterior part, horizontally, with a very striking resemblance to

the expanded hood of a cobra (*Naja*). When examined, it was found to be a female, containing forty large, sub-oval eggs, nearly ready for deposition, and this gives a sufficient explanation of its desire to attack, while the other one, presumably a male, made off into the bush. It seems to me that herein lies the simple explanation of the fact that certain widely distinct snakes, such as the innocuous yellow-tail (*Spilotes corais*) and the deadly bushmaster (*Lachesis mutus*), have been known, on good authority, to take the offensive when met with. It certainly is not the habit of these snakes always so to act, since they are frequently known to make off when troubled—a fact, that, in the case of the yellow-tail, at any rate, my own experience confirms.

Some few years ago there was a large Indian settlement at Pacoutout; and a clearing was made on the hill on the northern bank, over which the portage path runs and from which the view, commanding nearly the whole valley below, must have been extremely grand. The place is now deserted, however, and but one large settlement is met with, at Manakparu, about half-way between Pacoutout and Amutu, before the Kaieteur is reached.

From the upper end of the portage, the first distant view is obtained of the abrupt northern escarpment of the sandstone table-land, projecting like a bold headland into a sea of forest; and parts of this formation present themselves to view at intervals as one journeys along, until the actual valley is entered, which the river has hollowed out in the table-land during the long course of time. Soon after starting, a small rapid was encountered, and here the river was partly blocked by thick clumps of rushes (*Thurnia*), which afforded safe stepping-places in

the shallow water. Dreading the rough portage at Amutu for the bateau, which was an old and very wide one, we made attempts at Manakparu to obtain wood-skins for the remaining part of the journey, but without success, as the Indians were themselves preparing to set out down the river. This at least was the report that the men who were sent to the settlement, which is situated at a considerable distance back from the river, brought back with them ; besides, it was said that all the woodskins were of small size, though of this we had no means of judging, since they were certainly not sunk in the creek mouth at the entrance to the settlement, where they might be seen or reached by us.

At this settlement, on the Sunday, but few specimens were obtained, such as the smaller maroodie (*Penelope greeyi*), two uncommon bush-shrikes, and a few insects. Macaws and parrots were extremely plentiful, as indeed they were all through the trip, but owing to their lofty flight, high over the top of the forest, they were almost invariably out of range.

Early on Monday morning we started for Amutu, a heavy mist hanging over the river ; but gradually, as the sunrise came, the mist passed away and the change was ushered in with wonderful impressiveness. Previously, it had seemed, with the high line of forest on either side, as though we were passing through a tall and stately avenue into some phantasmal region ; but as the dawn broke and dispelled the mist, and woke the chattering and quarrelling of parrots in the high trees, and the quaint yelping of the bill-birds, besides the countless cries and whistles of other creatures, an indescribable cheeriness and freshness seemed to burst upon the scene, where the long and

narrow reach of the river, between the lofty, many-tinted forest trees, lay like a pathway to the sunlit, mist-crowned mountain, rising before us.

At Amutu, one passes from the narrow foam-flecked river into a wide bay, with its amphitheatre of dense forest, at the head of which the water thunders over the rocks, but broken up by an island in the middle into two parts; while, beyond, the valley opens between steep sides of sandstone. Turning to the right, we made for the portage path, and reached it with great difficulty owing to the shallowness of the water. On this side there was no fall of water, owing to the lowness of the river, and the high sandstone ledge across the channel was perfectly dry. The portage path here, which is about a quarter of a mile in length, and always quite unavoidable, was extremely bad owing to an overgrowth of prickly bushes and tall razor grass, which, added to the steepness of the hill and the frequent rocks along the track, rendered the pulling over a very unpleasant matter. On this account, only the narrow corial was taken over, with food sufficient to last for a few days—five of the men being left with the bateau, with directions to clear the path for our return.

Above Amutu, birds seemed to be in great abundance, but they were by no means easy to procure. A very fine green-winged macaw (*Ara chloroptera*), a large *Chrysotis* and a duraquara-hawk were, however, shot and made into skins. Parrots and macaws were constantly passing high over head, shrieking, out of range; while the red-billed toucan (*Rhamphastos erythrorhynchus*), the black bunya (*Ostiumops decumanus*), and the brown-barred wood-pecker (*Celeus*) flew across at intervals, but well ahead of the boat. Afar in the forest, the musical cooing

of the wood-doves plaintively sounded, while the bell-bird or *campanero* (*Chasmorhynchus niveus*) rang out loudly and clearly its own peculiar notes. The note of this bird has very differently affected travellers, by some of whom it has been described as of a deep bell-like character, and by others as more like the clinking of the hammer on an anvil. No doubt some of this difference is due to the individual sensitiveness of the ear for musical sounds, while the distance at which the bird is heard, and its age, also enter into its consideration. Two very distinct cries are certainly to be heard, the one of a deep bell-like character, something like the sound of the combination "do-ròng" (as Mr. C. B. BROWN expresses it), with the latter syllable prolonged; while the other is a clinking sound, like the combination "kong-kày," with the final syllable also prolonged.

Of insect life there was not very much to be seen. Species of the white, yellow and orange butterflies (*Pieris*, *Callidryas*, *Aphrissa*, *Phæbis*, etc.), and of the blue butterflies, chiefly *Morpho menelaus* and *M. achilles*, flitted along the banks or across the river, and occasionally with them the lovely, glaucous-banded *Prepona* (*Prepona amphitoe*); while small swarms of bees (*Xylocopa*) at times buzzed around, and some most tantalizing and persistent flies wearied out one's patience. In the forest, common species of *Heliconius*, *Pierella*, *Anartia*, etc., were met with, but among the bushes it was not easy to procure them.

At Warratu, where the last obstruction in the river is met with before the landing at Tukuie is reached, the luggage was carried over and the corial easily taken up by water; and we landed at Tukuie about

ten o'clock on Tuesday morning (March 26th) in time for breakfast.

The scenery of the river upwards from Amutu, had been of the grandest description. Steep cliffs, several hundred feet in height, in part bare, in part covered with forest or with irregular bushy growth, fronted or surrounded us, the river winding here and there between them. But it was in the morning, when the mist lay lightly over the hills, that the full beauty of the surroundings was to be perceived ; and as the mist gradually lifted, small patches rested on the slopes and floated like tiny columns of smoke from woodland settlements—or, as one of the crew feelingly remarked, “like people up there cooking coffee.” Once, a sudden bend of the river brought us immediately face to face with a bold escarpment of the formation, precipitous and bare, covered lightly with a veil of mist, above which the rich morning sheen lay upon the sky, and glanced down below upon the tree tops on the hill-side ; while, thrown back against this, the line of the forest by the river-side ran with clear outline, and here and there some huge mora trees, decked with their rich young colouring of leaves, rose, framed like a picture in a radiant setting. In the distance, where the great falls lay, the valley was filled with a dense mist throughout the early morning ; and at about two miles above Warratu, where the amphitheatre of the Kaieteur becomes visible for the first time, only a misty bank was discernible.

From Tukuie, the Kaieteur has to be reached by walking ; and at about eleven o'clock I started for the bottom of the falls, followed by the bowman, JEREMIAH EDWARDS, and three of the crew, who were desirous of accompanying

us. Here there is no track as there is to the top of the falls, but by following the latter track for a short distance, and then reaching the riverside by means of one of the flat-bedded creeks that flow down to it, one is able to walk nearly the whole distance along the bank without any greater difficulty than that caused by stepping or jumping, almost continuously, from boulder to boulder, which after a time, however, becomes extremely tiresome. At times a little wading in the water is advisable in order to get round some of the more formidable rocks.

The arduousness of this journey really begins, when, towards the upper cataracts, immense boulders with precipitous sides abut on the river, and render it impossible to pass round except through the forest, where, on a steep incline, instead of an ordinary soil, the ground-work consists of masses of sandstone of all shapes and sizes, more or less disintegrated and packed together, and usually covered with a treacherous layer of decayed vegetable matter, above which plants of all sorts, but chiefly creepers, spread themselves under the forest shade. The walking in such places can be better imagined than described, where climbing by means of roots and bushropes, slipping and sliding, and sinking in between rocks, was the order of procession. A gun that I carried suffered somewhat from the rough handling of the rocks; but this was nothing, I have since heard, compared with what other guns had suffered before. With the exception of a few wood-pigeons and bush-shrikes, there was nothing to shoot, and the gun after all was but a useless encumbrance. In one of Mr. C. B. BROWN'S trips, a large labarria (*Trigonocephalus atrox*) was met with and killed among these rocks, but we encountered none of these creatures.

At this upper part of the river, the Kaieteur ravine becomes a very deep, and rather narrow, winding gorge, with the sides on the right bank generally of a very precipitous nature, bare in many parts, and shewing frequent indications of small streams of water trickling down its face. In the wet season, when these streams become high cascades, the view must be considerably more impressive, but the arduous forest walking would then have to be much more frequently resorted to, owing to the greater height of the river.

After about three hours' walking, we reached the comparatively still water at the foot of the cataract, which slopes down directly from the edge of the pool into which the water falls. At this halting place we had a very good view of the upper two-thirds of the waterfall, now narrowed to considerably less than one-half the full width of its bed, but pouring a mighty volume of water sheer down from the edge of the immense amphitheatre, more than 800 feet above. Owing to the lowness of the river from the long drought, the water fell not as one undivided mass, but broken up by various projections of rock at the edge into a series of seven distinct falls, of which the western six were small, and occupied fully one-half of the total width, being dissipated into rain and mist before reaching the bottom, at distances from the top dependent upon the size of each. On the eastern side the great bulk of the water fell as one undivided mass.

At the eastern edge of that part of the bluff over which the river falls, and which here lies nearly East and West, the great precipice of the amphitheatre, curves out suddenly in a northerly direction, making a distinct angle with the remaining portion,

which runs westerly for an immense distance, passing into a wide and open curve round the head of the valley. The waterfall may thus be described as lying in the extreme eastern angle of the amphitheatre, facing almost due north, and thus opening out in a direction different from the general trend of the main valley below, the direction of which is easterly. It is thus hidden from direct observation from any point far down the valley, by the intervention of the northern projection of the eastern side of the bluff; and only a portion of the western part of the amphitheatre is thence visible, situated close to the western edge of the river bed—that part, namely, which is directly opposite the eastern aspect of the valley. In the wet season, when the river is very full, the water covers a portion of this part of the bluff, and thus becomes visible down the valley, wherever a clear view is obtained of the face of the amphitheatre—as for instance just above Warratu.

The front of the amphitheatre is sharply precipitous, banked below, on both sides of the river, by a huge, apparently smooth, green-covered bank, which follows the curve of the bluff and eventually passes into it. This apparently smooth bank, however, consists, in reality, of huge boulders of sandstone and conglomerate, with deep chasms between them, bare in the immediate vicinity of the water, but evenly covered beyond by a varied plant growth, among which the huge lily-like *Brocchinia cordylinoides* is very conspicuous.

From our halting-place at the foot of the cataract, two ways were open by which to reach the pool into which the water descends: the one by boring one's way, or cutting a path, through the shrubs which grow among the boulders

along the western side, as was done by Mr. BROWN in his visit in July, 1870; and the other—considerably the shorter, owing to the easterly bend of the channel—by swimming across the river to the eastern bank, as was done by Mr. BROWN'S companions, Sir GEORGE YOUNG and Mr. MITCHELL. In the dry season, at any rate, swimming across the river, in spite of the strong current, is nothing at all serious to any tolerably good swimmer; and the plunge into the cool water is indeed a most welcome refresher after the tedious walking. In order to secure dry clothing for the return journey, we all stripped, and, *in puris naturalibus*, with the exception of a pocket handkerchief over the head, we swam across, and clambered, and slid, and jumped our way along the smooth and reddish black, huge boulders, piled along the bed of the cataract, the total height of which is 81 feet. The water from the pool trickled down beneath these boulders, and was but rarely discernible between them. After about half-an-hour's peculiarly arduous and difficult walking, the bowman and I reached the edge of the pool—the other three men having stopped about half way, not caring to follow us by jumping across a deep and ugly-looking chasm, from one huge and smooth rounded boulder to another.

The pool is of very considerable size, being at this low state of the water apparently more than a hundred yards in length, and appearing about the same in total width, though, owing to the intervention of the great fall of water, no really accurate idea could be formed of it. In the wet season, however, the length of the pool must be considerably greater, for then the wide extent of bare and slippery rocks at the sides is evidently

covered with water, the greater overflow of which must necessarily thunder over the boulders in the wide cataract along which we had made our way. The water in the pool, at the eastern side where the great mass fell, was thrown into a wonderful turmoil, boiling and foaming in great banks, and spouting huge columns upwards, and for the greater part hidden by dense shifting vapour; while, at the outer part, the surface was broken up into small irregular waves, as on a wind-tossed sea. The roaring of the waters at this proximity was terrible.

The immensity of this grand natural formation can only be fully realised when one is brought, so to speak, into its actual presence, fronting it from the edge of the pool. The weird beauty of the scene, with the vast bluff of the amphitheatre, spreading outwards in all its immensity, and rising straight upwards, as it were, to the sky, for nearly 800 feet, with the great thundering mass of falling rocket-like water with its changing mist and rain and foam, outlined against the darkened rock behind, holds one with a feeling of awe; and one turns away from the scene, subdued and quieted.

The falling mass of water, split up into its various columns, was intensely beautiful, passing from its sherry colour at the edge to a rich amber and pale straw, and then to a creamy-white where it reached the pool; while at the outer and shallow parts, where but thin curtains of water passed, it broke up into pure white sheets, and faded away into clouds of fine vapour or mist, veil within veil as it descended, and visible, where the sunlight gleamed upon it, as a dense shower of glistening rain-drops or stars. The bottom of the small falls on the western side, consisted but of these gleaming masses

of descending mist, hovering over the surface of the pool; while, on the eastern side, the foaming water fell like an endless system of inverted rockets, or like an inverted succession of dense smoke-wreaths.

Owing to the comparative smallness of the fall, a very good view was at times obtained of the cavelike recess of the cliff behind, which must continuously be hollowed out to a great width in the sandstone, by the strong backsplash of the water below, and to a less width by the everpresent supersaturation of the rock higher up, down the greater part of whose face water must continuously be trickling. The recess extends sloping upwards and outwards to but a comparatively short distance from the top of the cliff, apparently to the line of the intensely indurated conglomerate which forms the river bed above. Though vertically of great extent, this recess is narrowed laterally, and must be almost hidden from direct observation long before the fall has reached its full width, though a lateral view of its basal part might be obtained from a favourable position. Dense masses of vapour drifted at intervals out of this recess, and generally they floated upwards over the edge of the precipice; but occasionally they were driven outwards and downwards over the pool into the open valley.

The edge of the cliff along the river bed is markedly irregular, due to the breaking away of parts of the conglomerate by the force and washing of the water; and it was owing to this that in this very low state of the river, the fall was broken up into the small channels on the western side. Apart from this, however, the appearance of the fall must be considerably changed at those long intervals, when, by the continuous disintegration of

the softer sandstone below, the conglomerate floor above the roof of the recess is unable to bear the pressure of the superincumbent mass of water, and is thence disrupted. After such disruptions the recess behind would be of the least extent possible.

Standing at the front edge of the pool, nude as we were, and altogether exposed to the cold currents of air and the mist that struck outwards from the falls, we became in a very short time terribly chilled, and were forced to begin our homeward journey—besides it was already late in the afternoon, and we had before us the same difficult journey for the return to Tukuie, and were by no means in a very fresh condition for it. The return swim across the river was most delightful, the water feeling quite warm after the chilling at the pool. It was not till just before sunset that we reached our camp, having encountered on the upland path the Rev. Mr. QUICK's brother, who, after spending a few days at Ichowrah, was now returning to his distant mission among the Macusi Indians near the Ireng river.

At Tukuie there was a large benab on the sand, into which, in the hurry of the morning when we landed, all our baggage had been placed; but, as was discovered later, the place simply swarmed with chigoes (*Pulex penetrans*) and fleas. Each man after entering this house for his packages, walked at once into the river to get rid of the chigoes which in that short time had clambered on the feet; and as we had no desire for a sleepless night, we all slung our hammocks to uprights on the open sand or from the trees.

Early next morning, we started for the top of the falls, along the well-beaten Indian track, the upper part of

which for some considerable distance leads steeply up the hill, and is rendered tiresome for walking owing to the numerous roots which crop out along it. On leaving the forest, the main track leads on right across the sand-stone plateau to the waterside far up on the Potaro ; while another track, turning sharply to the left, leads to the falls, first over a portion of the plateau, then through a narrow stunted fringe of forest running nearly parallel with the river, and then again across an intervening portion of the plateau, to the edge of the amphitheatre, towards which direction the sound of the fall is a sure guide. The superficial parts of this plateau or savannah, consist of a very uneven but indurated conglomerate, split up and broken up by small cracks and gulleys, bare in many parts, but usually dotted here and there, or covered with, a spare scrubby plant growth of ferns, grass, shrubs and creepers, among which the huge Bromeliad, *Bromelia*, is found in considerable excess, contributing towards the very peculiar *facies* of the savannah.

At various points along the edge of the amphitheatre fine views of the falls can be obtained ; and a markedly advantageous position is found close to the extreme edge of the bed, and formed by a broad shelf of rock projecting for a few feet clear over the edge of the precipice and supported by a smaller slab beneath. Standing at the outer edge of this rock, one commands to a certain extent a front view of the falling water. But the most satisfying view from the top was obtained by partially jumping from rock to rock, and partially wading through the shallow water, across the two small outer divisions of the fall, to a big and bold projection of rock at the edge, around which the river foamed. Here one stood

actually within the width of the foaming mass, and was able to gaze downwards at the wild scene, and outwards upon the marvellous panorama spread out below, away as far as the eye could reach. Below, a splendid rainbow, lying like a gorgeous band upon the mist and vapour, girdled the foot of the fall, and heightened the magnificence of the scene.

Gradually the eye takes in the individual parts that make up the special beauty of the view, and then one realises its perfect sublimity. The great foaming mass of falling water; the cavernous recess behind, with its passing clouds of vapour, blown out by the wind; the pool below, into which the water thunders, appearing quite small and undisturbed; the green-covered banks on either side, broken by the cataract of stones in the middle and by the still water below; the forming and fading masses of vapour, barred by the great arch of the rainbow, crossing pool and bank and precipice; the immense rocky bluff of the wide amphitheatre, passing on each side into dense forest; the open track of the valley below, with silvery stretches of water, here and there, amongst the green, marking the course of the river; and the immense forest-clad plain, shut in and broken up by mountain beyond mountain, and reaching away in the distance to the blue, cloud-barred canopy of the sky: these are but the separate points that the eye feeds upon—points that go to form the one indescribable picture that holds the senses enthralled the more one gazes.

On looking down on the rocky bed of the cataract that leads from the pool to the still water below, we could not restrain a smile in observing how short and

level it appeared, and how small the great boulders and the wide chasms seemed, over which we had so carefully and slowly made our way to the pool. Distance, indeed, lent enchantment to the view; for, the day before, it had been vastly otherwise!

Overhead, the white-throated swifts (*Chætura sonaris*), with loud and ceaseless twittering, circled backwards and forwards in dense flights high up out of range, dividing at times into smaller flights, parts of which darted at intervals down the face of the falls or into the valley, while the others wheeled overhead, and circled as before.

Search was made over and across the savannah, close to the falls, and along the track to the landing, for desirable specimens; but the region seemed almost destitute, the few forms observed being all common and widely distributed. Among these were a small barbet (*Bucco tamatia*), the old witch (*Crotophaga ani*), the palm-sackie (*Tanagra palmarum*), the silver-beak or cashew-sackie, (*Rhamphocælus jacapa*) one of the common species of kiskadie or qu'est-ce-qu'il dit (*Tyrannus melancholicus*), the black-breasted finch (*Oryzoborus torridus*), and one of the red-breasted grass-birds (*Spermophila minuta*). Among the butterflies were common species of *Morpho*, *Pieris*, *Callidryas*, *Phæbis*, *Pierella* and *Funonia*. A few lizards were heard amongst the grass, but we were unable to procure them. No snakes were observed in our short excursion, but during his botanical examination of this savannah in September and October, 1880, Mr. JENMAN, Superintendent of the Botanic Gardens, met with two species, one about twelve feet in length, said to be poisonous, and called "sarepoo"

by the Ackawoi Indians, and the other, a tree-snake, about five feet long, somewhat resembling the labarria.

The flowering season was long past, and it was but very rarely that either flower or fruit was noticed; though the dead flowering stems of the large *Brocchinia* told their own story. Doubtless the scarcity of animal life was in great part dependent on the barrenness of the savannah, a condition that the long drought must have considerably intensified. For two consecutive days the Indian huntsman ranged the district about the falls, and each day returned empty-handed. The collection made in this district was thus of a very limited kind, and consisted but of a few small birds, chiefly bush-shrikes and manakins, such as *Pipra suavissima*, and a few insects. Attempts had been made to procure the cock of the rock (*Rupicola crocea*), the hoarse cry of which was heard on the hill above Tukuie, but without success. A skeleton of a very singular form of well-armoured Siluroid fish, called *wata-wata*, apparently identical with *Plecostomus bicirrhosus*, was picked up between the boulders on the cataract below the Kaieteur pool. As already indicated, birds alone seemed to be fairly plentiful along this ravine of the Potaro, and with time to spare for their detailed collection, doubtless a good set might be got together.

Just above Pacoutout, on the return journey, a young welbiciri or wood-deer (*Coassus humilis?*) was shot; and the huntsmen brought in, besides, the usual quota of accourie and land-tortoises. The deer, though small, was a most welcome addition to the collection, for hitherto it had been unrepresented in the Museum. The young of the red deer (*Coassus rufus*) is often con-

founded with the welbiciri, which it somewhat resembles ; but its distinct ruddy colouring ought to serve easily as a distinguishing character. A young red deer had been procured earlier in the trip just below Tumamatamari ; and the contrast between the two skins was very marked, the colour of the welbiciri being more distinctly yellow-brown below, and chestnut-brown above. In the adult, the size is far inferior to that of the red deer or the savannah deer (*Cariacus savannarum*) ; and the pale coloured spots placed in lines along the sides are retained throughout life—unlike the cases of the other two species of deer in which the white spots of the young are lost with growth. In the welbiciri the head is very short, and the eyes and the lower front of the ear are marked by a distinct pale patch ; the under part of the body and the tail are nearly white, while the middle back is of a dark chestnut-brown, fading to a pale brown on the sides. The lines of spots are of a pale yellow-brown colour, the uppermost on each side being very regular and even, and very distinct on the dark ground colour.

Remembering the rare alligator which had been procured going up, we kept a good look out for these reptiles ; but though the curious pistol-like crack of their tails on the water was occasionally heard during the night, we had no chance during the day of procuring them. At Pacoutout, where the two boats were successfully taken down by water, a fine fall-bird was shot and a few good insects procured, together with a rare arachnid (*Acrosoma*) with a bifid spinose abdomen. Here, too, a very fine labba was obtained. The beast had been dug out and chased from hole to hole by the dogs in the evening, and the men, in despair, at last made a large fire at the

hole, which was afterwards plugged up so that the labba could not escape. In the morning it was found dead just inside, choked by the smoke, and its skin utterly spoilt by the fire: its flesh, however, was delicious.

Early on Saturday, the 30th, we reached the mission, and after reloading our own boat, and procuring, through the kindness of Mr. QUICK, a plentiful supply of limes, cassava, plantain, and sugar-cane—with the last of which the men provided themselves with large bundles—we started for the Indian settlement at Wiaparipie, where we camped and passed the next Sunday. Truly the mission at Ichowrah, so far as its position is concerned, seems to be not only most beautifully, but also most advantageously situated, for vegetables and other plants grow to perfection, as judged by the samples that came under notice.

At Tumatamari, we found it impossible to take the boat down the south channel, for the water was considerably lower than it had been a fortnight earlier; and we had therefore to let it down by the steep and dangerous northern part, which, however, was accomplished without any very serious mishap. One cannot but be struck with the escape from serious accident under such circumstances; for the chances of a safe performance are by no means always satisfactory, where the slipping of a rope or the sharpness of a rocky projection in the channel might make all the difference imaginable as to the result.

The districts about the junction of the Potaro and Essequebo are said to be very good hunting grounds, more especially for the large peccary or kairuni (*Dicotyles labiatus*) and the tapir or maipurie (*Tapirus ameri-*

canus), and our huntsmen were sent across through the forest on the southern side of the Potaro, to meet the boat higher up on the Essequibo, into which river we passed early on Tuesday morning. The change from the dark water of the Potaro to the clear water of the Essequibo was most striking, and towards the right bank, where the currents are strong, a sharp line of demarcation exists between them. With the exception of an ocelot, the hunters only succeeded in procuring the more usually occurring animals; but along the river, however, we were fortunate in getting two very fine sting-rays, a male and female, apparently of two different species, both of which were shot by the captain with the bow and arrow.

The bodies of these specimens were quite thick for their kind, being more than three inches at the centre, but quite thin at the edges. In shape they were nearly circular (with the tail inserted within the general outline), the larger female specimen being about two feet in diameter, though owing to repeated, and, in some parts, quite recent bites from the perai and other enemies, great junks of flesh were wanting at the edge, and thus gave an irregular outline; while the tail, which is quite short in comparison with those of their marine congeners, is rendered ridiculously short by being bitten off by perai quite close to the poison spine—a destructive weapon placed at about half the diameter of the body from the insertion of the tail. The upper surface was covered with small spines with stellate bases; but these increased greatly in size towards the tail, along which they were arranged in a distinct line along the top and sides. The poison spine in the larger specimen

is more than four inches in length, swordlike and flattened from front to back with serrated edges, the serrations pointing forwards. The wound inflicted by such a weapon is formidable in itself; but recent observations tend to shew that the mucous secretion over them is poisonous in its nature, and it is this deleterious matter which so often renders the wound serious in its results.

The two specimens in their colouring and barbs differed considerably from each other and from the specimens met with and described by SCHOMBURGK as separate species; but it is possible that sexual characters and wide variation may explain these points as found in one species. In the male, which was readily distinguished by clasping organs, the colour was of a dirty, yellowish slate, dotted over with orange spots placed in little groups of from one to six, like the pores in the cyclosystems of the Hydrocorallines; while the spine was single. In the female, the colour was duller and paler, and the pale orange spots were set in small, nearly black areas, scattered over the body; while there were two spines, the posterior one being shorter.

The related specimens found and described by SCHOMBURGK, whose figures indicate that the specimens were all females,* were referred to two species: *Trygon histrix*, in which the colour is greenish-brown, irregularly spotted over the body with black, and the spine double, the posterior one equal to the anterior; and the *Trygon garrapa*, in which the colour is of a yellow umber-brown, covered with yellowish white spots surrounded with a dark margin, and the spine single. These two apparently

* Fishes of Guiana, Vol. II., Plates 20 and 21.

distinct forms have been referred to the one species, *Trygon histrix*, by GUNTHER;* and in face of the wide variation of this specific type, the examination of a very large series of specimens is necessary before one can pronounce definitely as to the distinctness of the two Essequebo sting-rays obtained.

It has been remarked by SCHOMBURGK that, when transfixed by poles, the sting-rays frequently brought forth young ones, no doubt due to the anguish caused by the wound; and in the single female obtained, a similar extrusion of three young ones took place when a cutlass was pressed into its heart to kill it. The young were furnished with tails about twice the length of the body, and were entirely destitute of any form of spines.

The skinning of these large fishes, owing to their softness and sliminess, was of the most tedious and tiresome nature; and it required a considerable amount of devotion to complete them. As an instance of the effect of the barb, it may be mentioned that the jagged edges of the spine but slightly scratched one of my fingers, and this became quite swollen and charged with small vesicles along the scratch, and for days afterwards remained in a most painful condition. The fishes are justly dreaded; and considerable care is required in bathing or wading where they are found, since, owing to their fondness for burying themselves in the sand and mud, it is not always easy to distinguish them, though, when gliding over the bottom in the shallow water, they can be distinctly seen.

Soon after the rays were obtained, a splendid golden and spotted sun-fish or lucanani (*Cichla ocellaris*) was

* Catalogue of the Fishes in the British Museum, Vol. VIII., p. 482.

shot with the bow and arrow by young SCHOMBURGK ; but while the fish was being skinned in the boat, and its abdomen already quite cut open, an unlucky turn of the hand brought it in view of the water, when, with a sudden jerk, it escaped from the hand of the assistant and disappeared over the side, destined as an almost instantaneous prey for the perai. A perai, a freshwater bashaw, and a few shells and birds, were also obtained and preserved.

In order to procure a large supply of various species of fishes, it had been determined to poison one of the creeks near Warraputa with the haiari, but no favourable creek could be found, since, owing to the very dry weather, the water was reduced to most slender proportions in all those met with.

The main river itself was reduced to very limited proportions in many places, split up into small channels between the great banks of sand; and at Canaruck, where a huge tree-clad and broken dyke of greenstone runs across a wide curve of the river, the only passable channel was found at the extreme western end of the curve. All along this part of the river, the scenery, always varying in its character, was of the most charming description, the effect being heightened by the ranges of mountains on the western bank.

Not far above the Canaruck dyke, the first small rapids of the great cataract of Warraputa are met with; and here the pacu were found in immense numbers, darting and leaping nearly out of the water, and shewing their deep red colour to the best advantage. Above this we came to the great island that splits up the river into two main channels, and we camped on the left bank, at the foot of the long series of cataracts.

Here a Brazilian settler and his family lived on the site of the old mission station, and of the new one that is to be, for whose formation the Rev. Mr. QUICK, who had travelled down from Ichowrah, was making arrangements during the time of our visit.

At Warraputa, the river is impeded by immense bars and dykes of granite and greenstone, and it widens out over an extensive area, split up into small channels between the numerous rocky islets. Along the channel by the eastern bank, and about two miles above the settlement, are situated the curious "Timehri" or rock inscriptions. These interesting remains are being rapidly destroyed by the disintegration of the rocks on which they are found. In many places the inscriptions are already obliterated, and it is impossible to declare what was the original pattern from the one or two lines or curves existing. Many of the huge blocks on which the "Timehri" are most distinctly seen, have been split up by the agencies of heat and moisture, and parts of one and the same inscription are to be found on the adjacent parts of the blocks.

They evidently were of considerable depth originally ; and indications of this are to be found in one or two places where the ridge between any two lines of the inscriptions is considerably higher than the generality of the others. When one takes into account the extraordinarily active denudation to which these rocks are alternately subjected, at one season exposed to the action of aerial, and at the other to aquatic forces—for they are submerged when the water is high—one cannot but realise that these inscriptions, if they be at all ancient, must have been of at least some inches in

depth, in order that they should have lasted to the present time.

On many of the rocks, a very considerable caking off of the surface is taking place—a superficial cleavage that removes, in some parts, a layer more than an inch in thickness. Many of the "Timehri" inscriptions are found on such shelving masses, and in places where a thick layer has already partially broken away, the inscriptions are either entirely wanting or are but barely discernible on the newly exposed under surface. On one large overturned block, which seems to have been more or less cubical, with inscriptions on its four sides, the patterns are clear but shallow, and the splitting up of the large block, both horizontally and vertically, is a present sign of its early destruction. Even at the very low state of the water at the time when I inspected them, some of the rocks on which inscriptions were found were partially submerged: and while there is nothing to shew how long ago the displacement here evidenced took place, the guesses one might make at the antiquity of the inscriptions are at the best perfectly futile. The question of the implements made use of to cut out characters or figures of the kind here shewn, is one, too, that is fraught with a good deal of perplexity.

At Warraputa an interesting collection of specimens was made; and it was with great regret we were compelled to turn away after a day's stay—the limit of the trip being nearly reached. Judged by the light of our short experience, the district and its neighbourhood would make a splendid collecting ground. All the great groups are represented by typical forms; and doubtless

a few weeks' careful examination would be productive of a large number of interesting specimens.

During nearly the whole time of our stay, rain fell in torrents, as though to warn us that the wet season was at hand; and on this account not only the collecting of specimens, but the preparation and drying of the skins suffered considerably. Very fine specimens of the quata or spider monkey (*Ateles paniscus*) and the beza or bearded saki (*Brachyurus satanas*) were obtained. These two forms may well be taken as select members of the Platyrrhine division of the monkeys—a division that is as sharply characteristic of the American continent as the Catarhine division is of the old world. In both forms the faces are wonderfully human in aspect. In the quata, the skin of the face is of a pinkish tint, in wonderful contrast to the long black hair on the body, and the whole expression is gentle and mournful; while the beza is black-faced and black-bearded, with long black hair on the head and parted in the middle, while the expression of the face is one of alertness, if not of fierceness. The platyrhine character is well shewn, in both the septum of the nose being thick so that the two nostrils open sideways; while the catarhine character of a thin septum to the nostrils is exemplified in man, and the man-like apes and the other monkeys of the Old World, in which the nostrils open downwards.

Among the birds, specimens were procured of the war-racaba or trumpeter (*Psophia crepitans*), of the brilliant and curious houtou (*Momotus brasiliensis*)—a bird with the curious habit of pulling away barbs of its two elongated tail feathers, which thus become quite paddle-shaped; of the lovely sun-parrot or hia-hia (*Derop-*

tyus accipitrinus) with its gorgeous erectile ruff of blue and red feathers ; of the scarlet-headed fall-bird (*Paroaria gularis*) ; and of the yellow hangnest or mocking-bird (*Cassicus persicus*) and other specimens. Parrots, macaws, king-fishers, herons, ibises, bitterns, ducks, tanagers, shrikes, swallows, doves, etc., were plentiful, but in our short stay they were not obtainable. A few insects and some interesting shells, chiefly bivalves, were also collected.

The specimens of fish caught, though few in number, were very interesting in kind. Two perai (*Serrasalmo*) were taken by the hook, and one of these was placed in spirit, while the other, a large one, was placed overnight in a pool of water hollowed out in the sand, from the bottom of which a large quantity of decayed vegetable matter was taken to deepen it for the wide body of the perai. The specimen died and became spoilt before morning ; but the trouble of making the pond was rewarded by two most interesting species of small Siluroids which were taken out among the mixed sand and decaying leaves. Both species are referable to the *Loricaria* or mailed Siluroids, and are allied to the hassars (*Callichthys*) from which, however, they differ considerably in form, having depressed bodies rapidly decreasing in size to the tail, with the mouth quite on the under aspect of the body and almost destitute of distinct barbels, and with tails of unusual shape — in one form almost destitute of an upper lobe, and in the other with each lobe drawn out into a very long thread-like process. In the latter specimen, the front of the head is produced into an elongated rostrum, so that the form is evidently referable to the genus *Acestra*, and differing from the *A. amazonum*

only in having the snout slightly upturned and thickened at the extremity. In the former specimen, the mouth is furnished with the hairy processes characteristic of *Chætostomus*, and the species seems to be identical with the *Chætostomus leucostictus*, in which the opercular spines are short and few in number.

Another fine Siluroid caught at the camp was the maripak (*Perinampus typus*), a fish of fine steel-blue colour above, passing to grey below, and remarkable from the peculiarly large and broad barbels which had much the appearance of long and narrow pieces of tape. This fish presents a very good example of the soft and scaleless skin destitute of the osseous scutes so characteristic of the generality of the *Siluridæ*.

Among the islands, a considerable number of orchids might be collected, the most easily obtained being species of *Epidendron*, *Brassia*, *Brassavola*, *Maxillaria*, *Batemannia* and *Zygopetalum*, the last of which are found on the greater number of trees on the banks close by the "Timehri" inscriptions. The forest apparently abounds in valuable products, and some few years ago, the district above Warraputa was the head-quarters of the trade in gums, tonquin beans, etc., carried on by American collectors. A few miles above Warraputa, at Thawah, gold is also being obtained in paying quantities; so that the vicinity is an interesting one from many standpoints.

It was at Warraputa, that the even tenor of our proceedings was varied by a little degree of excitement, due to the non-return at night of one of the Indian huntsmen who was a stranger to the district. The captain's great horn was long and lustily blown, the guns were frequently

fired, and the boat sent up and down the river to search for him but without result; and in the morning another Indian was sent out, blowing the great horn. Almost immediately after, the missing huntsman, who had followed a deer too far and had been overtaken by the stormy night, turned up from the opposite direction and proceeded to consume his early meal as though nothing had happened; while in the distance the great horn was sounding out for his return, and kept on sounding for some considerable time ere the blower could be re-called.

On the return journey, a camp was made quite early at Canaruck—a place noted as a special hunting-ground for the lau-lau and other large Siluroids—where also two fine peccaries (*Dicotyles torquatus*), two maams (*Tinamus sub-cristatus*), and a large powis or bush-turkey (*Crax alector*) were procured and skinned. The peccaries were horribly infested with the small and hard bush ticks, and it was altogether out of the question to keep them off one's body, since the crab-oil which is a very good preventative against all these parasites, had been lost a day or two before by an accident to the bottle.

The long line fishing yielded no lau-lau, but a very fine tiger-fish (*Platystoma tigrinum*) was caught, brilliantly marked with its black and white cross stripes on the blue and scaleless ground, and with red fins; and also a large golden-eyed baiara (*Hydrolycus scomberoides*) more than two feet in length, with bright silvery scales and two enormously long and sharp strong teeth in the front of the under jaw, fitting, when the mouth is closed, into sockets in the upper jaw, like the so-called canine teeth of the alligator. Both of the specimens

were skinned, but the baiara having been caught early was almost too soft for the purpose.

Earlier in the evening, a large paruaruima (*Phractocephalus hemiptyerus*), or so-called fresh-water gil-backer, was caught on a short line, but, as it was pulled out of the water, a perai leaped at its tail and denuded it of half of its caudal fin. The paruaruima is noted among all the fishes of Guiana for the extraordinarily loud noises which it makes when it is drawn out of the water—loud bellowings they may be termed, rather than gruntings; and certainly the specimen which we caught did not belie its reputation. It was placed in a small shallow pond to be kept alive for skinning till the morning, and during the night it gave loud voice to its discomfort. Unaccustomed as I was to the noise, its loudness was to me, at first, a constant surprise.

This fish, of which kind only one species is known, is of a very striking form and colour. The body is large, but the head is disproportionately large, and is covered by a thick helmet which meets a smaller dorsal plate in front of the dorsal fin. The cavity of the mouth, the stomach and the air-bladder are very capacious. The upper part of the body is olive-brown, the shields being paler and covered with black depressions; the sides are bright yellow, passing into a whitish-yellow below; while the tail is rich orange, with intensely red inter-spinous streaks, and the other fins more or less tipped with reddish-yellow.

Our camp had been made on one of the islets of a large greenstone dyke, overlooking the various sandbanks in the curve of the river. On one of these banks the men had taken up their station for fishing—the long lines

being taken out into the deep water by the boat—and their voices could be just distinguished, borne across the water by the breeze, amid the varied croaking of the tree frogs, which, during this evening in particular, seemed to be *en fête*—perhaps excited by the loud bellowing of the paruaruima. A caiman, evidently a large one considering the peculiarly loud and prolonged groaning sounds which it uttered, visited the waterside just after dark, and from the closeness of the cry, the reptile must have landed, before being disturbed, close by where the dogs were tied and where the bush-hogs had been skinned and cut up in the afternoon, not more than about ten yards from our hammocks. The Indians maintained a stolid indifference to the sounds, but my assistant and I hurried to the waterside with the breech-loader and rifle, and paraded there like two sentinels, nearly bursting our lungs in the endeavour to closely imitate the sound of a brother caiman—apparently with but indifferent success, judging from the roars of laughter to which the men on the sandbank gave vent. We at last saturated the viscera of the bush-hog with arsenical soap, and placed it as a bait on the sand; and though in the morning it had disappeared, the reptile was nowhere to be found: its meal, however, must certainly have been a fatal one for it.

During this evening, for the first time in my bush travelling, I observed the intensely bright luminosity at times noticeable with certain kinds or conditions of decaying vegetable matter. The small pieces of soft white wood from which the luminosity arose, gave rise to the light not only on their surface, but from the inner parts when they were laid bare; and when they were

rubbed, minute particles broke away and adhered to the fingers as though a piece of phosphorus itself had been handled. The superficial parts, however, were more luminous, especially where small fungal growths were distinctly noticeable; and it is possible that the luminosity was attributable to this cause of decomposition, whose minute mycelial threads would necessarily ramify throughout the soft woody tissue.

It is not often that, in a state of nature, instances of decrepitude are met with. The conditions of natural life soon weed out from the struggle for existence those that are infirm, whether from disease or old age, and which are thereby incapacitated not only for acquiring the means for their existence, but also for protecting themselves against the dangers inseparable from life. One such instance we met with in an old male "baboon" or red-howler (*Mycetes seniculus*), in which the whole body was extremely emaciated, and covered with very pale yellowish-grey hair, though its limbs, tail and beard were considerably more normally tawny-red in their colouring. Its beard too was very long and full, and its teeth large and black. Altogether, it was simply what might be described as a faded specimen of skin and bones.

A little above Shipariparu, the site of our first, and, as it happened, of our last Sunday's camp, we came upon three fine specimens of our largest stork, the negrocop (*Mycteria americana*)—the only ones we had seen on the trip—standing on the bank like white-bodied statues, with black heads and bills, and red-collared necks, distinctly outlined against the yellow sand. They never gave the chance of a range from the waterside, and, as though scenting danger, always alighted so far from the forest

line as to render it useless to attempt stalking them from the bush. When we landed at the camping-ground, they were quietly standing on the opposite sandbank as though to study what our future movements might be; and there they stood, motionless, till the sun went down.

Early next morning, the curious whistle-like cry of a quata monkey (*Ateles paniscus*) was heard some distance away from the camp, and a Macusi huntsman volunteered to get it, imitating its cry so exactly as to afford a very good instance of the comparative ease with which a good bushman is often able to procure the animals needed by him, by practically calling it to him to be shot. When the man had disappeared some little time in the bush, so that the loudness of his voice was deadened, it was perfectly impossible for me to distinguish which was his imitation and which the real cry of the brute. Not long after, he returned with the specimen, which added a very fine skin to the collection.

We landed at Cumparu on Monday morning, and walked a short distance along the Indian track which leads to the Demerara river, on our way disturbing a flock of monkeys which scampered away, shrieking, in the tree-tops high up out of range, swinging themselves from branch to branch. A few immense old mora trees were met with that served well to give one an idea of the sizes of these giants of the forest. The central parts below were quite hollowed out, and the huge trunk above was supported by a series of massive and broad buttresses.

Opposite Yaya mountain, the river was reduced to a small and narrow channel on the right bank, the width of the river being occupied by immense sandbanks, here and

there covered with a few inches of water. As this would be almost our last chance of prolonged hunting, we camped early on the left bank opposite Arrisaro mountain and sent out huntsmen in all directions on both banks. The only result, however, was a few accouries, a fine owl, and a female quata monkey and her young, the latter of which was perfectly hideous in appearance.

Here was our last chance for lau-lau ; and fortune at last was kind to us, for one was secured, though a comparatively small one, a little over three feet in length. Another and a larger one was hooked, but it broke away at the very edge of the water during its frantic struggles while being drawn out. The lau-lau, like the paruaruima, makes a very loud bellowing noise when taken from the water, and doubtless when full-grown specimens of from ten to twelve feet in length are caught, the noise must be remarkable.

The drawing of the fish, as given by SCHOMBURGK,* is not quite representative : a specimen appears deeper from front to back—especially at the dorsal fin—in proportion to its length, than is shewn in the figure, and the second pair of mandibulary barbels are longer, reaching to the insertion of the pectoral fins; while from the anterior extremity of the dorsal fin, the body slopes slightly and gradually to the extreme rounded edge of the upper jaw, so that the whole space is one slight concavity, and is destitute of the anterior swelling which seems represented in the sketch. The head and the front of the trunk are, therefore, markedly depressed.

The skin is soft and reticulated, covering the whole

* Fishes of Guiana, Vol. I., p. 193.

upper surface of the head and neck, and of a prevailing greenish-purple or black colour, fading into a silvery grey below, with obscure dark spots. The head is broad and flattened, widening slightly to the pectorals, and nearly one-fourth the length of the body (including the caudal fin); the upper jaw longer than the lower; teeth small, fine, and crowded in a broad band upon both jaws. The band upon the palate is separated by a narrow interval; the eyes are small, and with bluish-grey iris. The barbels are six in number: the first mandibular pair short; the second longer, reaching to the insertion of the pectoral fins; and the upper pair very elongated, reaching nearly to the end of the ventral or pelvic fins. The adipose fin is high in front, sloping down to the body behind, and slightly longer than the anal.

D. 1/6. P. 1/9. V. 1/5. A. 13 (12).

The first dorsal ray is a thick spine, smooth in front, jagged and finely spinose posteriorly, and produced above into a distinct whip-like filament. The first pectoral ray is a sharp, strong spine, serrated on the hinder margin. The first ventral is enlarged, but flexible. The tail is symmetrically lobed, but the first ray of the upper lobe is produced into a whip-like filament. The first anal ray is very small and short and almost inconspicuous. The lateral line is distinct, and much curved, continuous behind with a prominent rib.

The body, behind the pectoral fins, rises high upwards to the dorsal fin, where a transverse section is nearly triangular in shape, though the sides bulge out and are rounded: it becomes slightly flattened above to the adipose fin, where it rises a little and sinks again to the tail. Behind the pelvic fins the body becomes sub-cylindrical.

From this detailed description it will be seen that the lau-lau is clearly identical with the *Piratinga reticulata* (the old *Bagrus reticulatus* of Kner), from whose terse description, as given by GUNTHER,* it differs only in the presence of an extra or thirteenth anal ray. This, however, is so small that unless they were exposed by a section, it would be unnoticed, as possibly was the case originally. It is, however, a point of no real importance. The lau-lau has thus a wide distribution, being already recorded from the Rio Araguay, Rio Branco, and Rio Madeira.

The flesh of the lau-lau is delicious, as indeed is the case with the flesh of the great freshwater Siluroid fishes generally; and although, while the specimen was being skinned in the boat, it was exposed to the hot sun till late in the morning, it was a most delicate morsel, even when prepared in the rough manner that is more or less general in bush life.

The great family *Siluridæ*, to which the lau-lau, the tiger fish, the paruaruima, the maripak, the gilbacker, the wata-wata, the hassars and other similar fish, belong, is, after the Carps (*Cyprinidæ*), the largest family of the fresh-water fishes; and it attains its greatest development in this region (Neo-tropical), where it also enters the shore waters. From the other Teleostean fishes which are provided with a swimming bladder communicating with the outer medium by a special duct (*Physostomi*), this family is distinguished by its naked or scaleless skin, in which bony scutes are often found, and by the possession of paired barbels, or small elongated tactile organs, around the mouth. The first ray of the dorsal

* Catalogue of Fishes in the British Museum, Vol. V., p. 113.

and pectoral fins is also generally a hard and strong moveable spine ; while an adipose or fatty second dorsal fin, of very variable form, is a common characteristic. Among the Siluroids many of the largest freshwater fishes are to be found.

Lower down the river, at "The Croft," among the rapids at Aretaka, where we landed and procured some large clumps of an *Epidendron* (*E. bicornutum*), we saw a thick part of a fish, known as the shanna or black lau-lau, which must have been of some seven or eight feet in length. The species was said to be of much the same shape and size as the lau-lau, but with the skin marked all over with large black spots. It would appear to be either a *Platystoma* or *Pimelodus*, but there was no possibility of fixing the identity of the species.

Among the rapids just above Marihi, we were most fortunate in obtaining a specimen of the native cormorant (*Phalacrocorax brasilianus*), a bird which had hitherto been unrepresented in the Museum, and which is but rarely procurable. It is of a prevailing shiny black colour, with greenish reflections, having very short legs, and a long rather thin bill, suddenly hooked at the tip, where it looks as though a small extra piece had been added.

This was the last good specimen procured, for although next morning (Thursday, April 11th) we shot a young specimen of the tree porcupine (*Sphingurus prehensilis*) before reaching Bartica Grove, it was so covered with sores as to be altogether unfit for preservation.

The trip was at last over ! On the whole it was a very successful one ; for though several of the specimens that I had expected to get, had not been procured, yet, on the

other hand, several were obtained that I had not expected. The real test to me, however, was that a large collection of desirable specimens was added to the Museum, a very large number of which had never previously been represented in it, and which were only procurable on a long trip into the interior; together with others which were needed to renew old and faded specimens in the exhibited series.

Among the specimens collected, there were 20 dried skins of Mammals with their skulls, referable to 11 species, and 7 spirit specimens referable to 2 species; of Birds, there were 114 skins, referable to more than 70 species; of Reptiles, there were 3 dried skins, referable to 3 species, and 8 spirit specimens of 5 species; of Batrachians, 8 spirit specimens of about 5 species; of Fish, there were 13 dried skins of 10 species, and 10 spirit specimens of 6 species; of Mollusca, more than 40 specimens of about 9 species; and a miscellaneous collection of Insects, Arachnids, Myriapods and Crustaceans. Besides these there were a few special Indian ethnological specimens, and some plants.

During a short collecting trip, the specimens obtained in each group bear no relation necessarily to those that are to be found in the various localities; and until a prolonged examination, rendered possible by long residence in suitable localities, has been made for the various groups, as has been, and is being, carried on by Mr. HENRY WHITELEY for the class of Birds, so long must our knowledge of our Fauna be considered incomplete and unsatisfactory.

Occasional Notes.

[Owing to the press of other matter, the various items of Occasional Notes are deferred; and only those two or three special points are referred to here that are called for in the present issue.—ED.]

Identifications of Guiana Timber Trees.—In the last issue of *Timehri*, page 386, a list of the identifications of various timber trees of Guiana was given, having been extracted from the Descriptive Catalogue of the Colonial Museum, Haarlem, 1888.

In this catalogue, Wamara, Bannia or Brown Ebony is classed under the one technical term of *Swartzia tomentosa* (D.C.); while Washiba or Bow-wood (Man-letter-hout) is referred to the *Piratinera guianensis* (Aubl.), and Dakamaballi or Black greenheart to *Vouacapoua americana* (Aubl.).

In a letter from Mr. MICHAEL MCTURK, whose familiarity with the timber trees of the colony is well-known, he informs me that "Wamara and Bannia are very distinct trees, not at all like one another;" that Washiba is not letter-wood, but is bow-wood, the two kinds of letter-wood being Bouracouroo and Tibicusi, the latter of which is often used for bows, though Washiba is better; and that Dakamaballi is not Black greenheart, nor anything like greenheart.

From this it would appear that the collectors of the specimens described in the Haarlem catalogue, wrongly associated the names of Wamara and Bannia in the first

case; confounded the Tibicusi with Washiba in the second instance, being misled by the term bow-wood applied to each; and misapplied the term Black green-heart to Dakamaballi in the third case.

If Mr. MCTURK would obtain specimens of the flowers, fruits, and leaves of each kind of the trees confounded, it would be an easy way of definitely settling the matter; and he would be doing a service not only for the Haarlem Museum, but for the colony and for science generally.

Additions to the Guiana Fauna.—In a small collection of twenty-eight species of birds, recently forwarded to London to be mounted for the Colonial Museum, and which were most kindly determined for me by Dr. SCLATER, F.R.S., the Secretary of the Zoological Society of London, and the well-known ornithologist, the following four species occur, which had hitherto been unknown from the colony, and which are, therefore, not recorded in the list of Birds of British Guiana, lately published in the *Ibis* by Mr. O. SALVIN.

- 1.—*Cathartes (Catharista) urubitinga.*
- 2.—*Querquedula cyanoptera.*
- 3.—*Erismatura dominica.*
- 4.—*Porzana flaviventris.*

Of these, the first is a species of carrion crow; the second and third are ducks, and the fourth a crake.

Detailed description of these and the other members of their genera or kind occurring in the colony, will be given in a later issue.

Sea-anemones in Guiana.—In last issue of *Timehri*, page 311, it was stated that no true-coral forming zoophyte or sea-anemone had so far been met with on the coasts of Guiana. I am glad, therefore, to be able to

point out, through Mr. RODWAY'S assistance, that, though no such forms have been hitherto recorded from the colony, yet two species of sea-anemones, of comparatively small size, certainly do occur here. Of these, a detailed notice will be given later.

J. J. Q.

Reports of the Meetings of the Society.

Meeting held on 10th January.—G. H. Hawtayne, C.M.G., C.M.Z.S., F.R.G.S., President, in the chair.

There were 23 members present.

Elections.—Members: S. Coronel, Capt. Cartwright, J. S. Irwin, Dr. A. Matthey, Dr. W. J. Von Winckler, Joao Baptista and W. B. St. Aubyn.

Associates: C. W. Peppiette, Rev. S. Manning, C. H. Wilkinson, S. H. Bayley, Aloysius DeWever and J. L. Theobald.

The President, in addressing the meeting, said that their late President, Mr. Nind, had given them such an interesting and valuable account of the progress of the Society during the past year, that there was nothing left for him to say with regard to the past, and it was very difficult to say anything in anticipation of the future. When the Treasurer presently read the financial statement for the past year, he thought they would be able to see that the Society was in a wholesome and sound condition, but at the same time there were indications that economy must be practised in the future. The subscriptions were not so large as they had been, and therefore they must curtail expenses to a certain extent, but he hoped that the Directors would be able to do this without impairing the efficiency of the Society. There were several important matters to which it would be desirable to give attention during the coming year, among which were the fruit and gold industries. The Society had reason to congratulate itself on the condition of the

Museum; he thought it had been a large factor in the education of the people, and when they looked at the large number of visitors and saw Mr. Quelch giving instruction to all classes of enquirers, they might say it was a public institution of very great value. The Museum is, however, neither large enough nor sufficiently convenient either for preparing or exhibiting specimens, and he thought they might fairly ask the Government for aid to extend it. One of the objects of the Society when it was first started, was to keep up a correspondence with similar institutions in different parts of the Empire; this had been found difficult, and had been almost discontinued, but he thought the Society should again pay attention to this matter. The Commercial Committee promised to be of very great service, and if it should ultimately develop into a Chamber of Commerce, the Society would have the credit of having originated a body of very great value. In conclusion he said that he felt proud of the position in which their kindness had placed him, and was not blind to its responsibilities, and he hoped that the Society would not suffer in his hands in 1889.

The Treasurer laid over the Financial Statement for 1888, Statements of the losses and gains in members, Balance Sheet, &c. In laying over these papers Mr. Conyers said that, with the present number of members, the income of the Society for 1889 would be \$2,876, which together with the rents would make a total of \$5,360. He thought that the expenditure could be kept down to \$5,000 without detriment to the interests of the Society. Several items in last year's expenditure would not occur again. The Museum account was kept separate,

the amount received from Government being \$4,500. It would be impossible to extend the Museum from the funds of the Society, and he agreed with the President that, as it was really a public educational institution, the Government might be asked for aid to that purpose.

Mr. Tinne proposed and Mr. Jacob Conrad seconded, that the Treasurer's Accounts and Report be adopted, which was carried unanimously.

Mr. Davis gave notice of the following motions:—

1.—Premium of \$100 to be given by the Society for the erection of a kiln to dry Indian corn.

2.—\$100 to be put at the disposal of the Commercial Committee for show cases to exhibit commercial products of the colony.

3.—Premium of \$100 to the first person who shall export 1,000 bunches of bananas or 20,000 oranges.

4.—\$300 to be voted to the Agricultural Committee to establish a system of immigration from the Azores and Madeira.

The Secretary reported that, at meetings of the respective Committees held on the previous Monday, the following officers had been elected:—

Agricultural Committee.—R. J. Kelly, Chairman; Hon. B. H. Jones, Vice-Chairman; George Garnett, Hon. Secretary.

Commercial Committee.—J. E. Tinne, Chairman; A. Weber, Vice-Chairman; W. Cunningham, Hon. Secretary.

Mr. Tinne stated, for the information of the meeting, that the Commercial Committee had met that morning, when Mr. A. P. P. Mackey had been elected in the room of Mr. Dare, who was leaving the colony. He would like to know from the President whether the Society would be likely to interfere with the Committee if it should entrench on what might be considered, in a strict sense, political matters?

The Royal Agricultural and Commercial Society of British Guiana.

REPORT OF SOCIETY'S MEETINGS.

171

RECEIPTS AND EXPENDITURE FOR THE YEAR 1888.

RECEIPTS.	EXPENDITURE.
To Society's Funds 31st Decr. 1887	\$ 5,473 48
" Subscriptions—	
" Ordinary Members ...	... \$ 1,501 50
" Country Members ...	... 463 50
" Associates ...	... 640 00
" Lady Subscribers ...	... 26 25

" Arrear Subscriptions	2,631 25
" Rents ...	... 35 50
" Catalogues ...	... 2,340 00
" " Timehri Old Account	... 89 28
" " Interest \$31 94, and Profits	... 4 24
" " \$155 32 from Hand-in-Hand Insurance Company ...	287 26
" " Scrip from Hand-in-Hand Insurance Company ...	... 155 32

Y 2	5,542 85

By Salaries and Clerical Assistance	\$ 2,367 50
" to Hon. Treasurer	... 706 94
" Periodicals and Magazines	... 858 42
" New Books added to Library	... 832 50
" and Freight on same	... 298 26
" Advertising, Binding, Stationery, and Sub.	... 966 46
" Printing New Catalogue	... 498 36
" Repairs to Buildings, New Shelving and Latrines	... 832 50
" Cost to date, New Extension	1,130 76

Insurance with Hand-in-Hand Insurance Company—Buildings and Contents \$25,000 at $\frac{1}{4}$ per cent.	437 50
" Cost of Two Parts " Timehri to 30th June, 1888	... 325 09
" Gratuity to Mr. Crumpton	... 500 00
" Law Charges in connection with Ridgway	... 101 52
" Gas \$34 78, Postages, Reading Room, and Petty Expenses	... 233 43
" \$198 65 ... ...	... 2,890 35
" Society's Funds per Balance Sheet	... 1,597 54

	\$ 11,016 33

The President in reply said he did not think they had any need to fear repression, if they confined themselves to subjects that were non-political in the right sense, which would include what is known as Political Economy.

The Secretary read a letter from the Government Secretary to the Commercial Committee, asking that body for a report as to the advisability of a revision of the Colonial Duties and Customs Ordinance.

The President said that this letter would serve as an answer to Mr. Tinne with regard to political questions. The Society is responsible to Government with regard to its constitution, and here was a case of what may be called a political question referred to them by the authorities. The letter was referred to the Committee.

The Secretary read the following letter from Dr. H. A. A. Nicholls, Dominica, in answer to queries as to the packing of fruits for shipment:—

Sir,—I beg to acknowledge your letter of the 23rd ultimo, and I have pleasure in supplying the information you desire in regard to export trade in oranges and limes.

The fruit is picked from the trees in a green condition. That is, the fruit must be fully formed, but not ripe. The best condition is just before the colour turns from green to yellow. The greatest care possible must be exercised in the gathering, as thereon depends, to a great extent, the success or not of the shipment. Special spring hand scissors are made in the States for the cutting of the stalks of the fruit, for it must not be *pulled* off the trees, but carefully *cut* from the bearing branch, in order that no bruising may result. Long step ladders lightly made for portability, have been imported here from the United States for the purpose of gathering oranges from the trees. They are known, I believe, as fruit-gathering ladders. After the fruit is gathered it should be carried carefully in shallow baskets to the store, and there allowed to remain spread thinly on the floor, or on shelves, until it is perfectly dry. It is then picked over, the bruised and inferior fruit rejected, and the stalks cut close to their insertion in the fruit. The next thing is to sort the fruit, for better prices will be gained in the markets if the

oranges in each box or barrel are of uniform size. Each orange and lime is then wrapped up in specially prepared coarse yellow paper, and carefully placed in the box or barrel. The paper is 14 inches by 18 inches in size, and it costs 27 cents per ream in Dominica. It is imported from the United States. I send by book-post a few sheets of the paper in order that you may obtain the proper kind.

The boxes used for shipping oranges and limes measure about $2\frac{1}{2}$ cubic feet. They will hold from 160 to 170 oranges, and from 700 to 800 limes. The two ends are made of solid wood, and a division similar to the ends is placed in the centre, so that there are two compartments. The bottom, the top and the sides are open laths. The boxes come out from the United States in separate pieces, and they are put together in the island. They cost about 24 cents each when put together ready for packing the fruit.

The barrels used for shipping fruit are the ordinary flour ones, but holes are cut in the staves, and at the heads, for the purpose of ventilating the fruit and keeping it cool. A barrel when properly packed holds, on an average, about 350 oranges or from 1,400 to 1,600 limes.

The holes are cut roughly with a hatchet, and after a while a man may become so expert in the work as to prepare a barrel in a very short space of time. Five holes, or rather *slits*, are cut at the bilge, two inches wide and eight inches long. The slits are made at the edge of the staves, or two staves may be taken in, and this then will be less weakening to the barrel. Four slits are then cut at each end, between the head and bilge hoops—these are 3 inches long and 2 inches wide. Thus there are five 8-inch slits and eight 3-inch ones—or thirteen altogether. In addition to these, two holes, cut in the form of half moons, are made at each end. (A rough sketch forwarded will show at a glance the exact way in which the holes were arranged.)

When barrels are prepared for limes, the slits are made only an inch wide instead of two inches. The barrels in Dominica cost 30 cents each when ready for the fruit.

It is found that the fruit reaches New York in a better condition when packed in boxes, and considering the longer journey it would have to undergo if shipped from British Guiana, it is doubtful whether it is advisable to employ barrels or packages in your colony. I noticed in the fruit markets in London, that maize husks are used in the packing of Sicilian lemons, each layer of fruit being kept apart by this absorbent material. In an experimental shipment of oranges I made to London many years ago, I endeavoured to follow this system by

using cane trash. It answered admirably, for the oranges got to England in excellent condition. This experience may be useful to British Guiana shippers, and perhaps a layer of cane trash between each tier of oranges in a barrel, may enable that cheap package to be utilised in Demerara.

H. A. ALFORD NICHOLLS.

Mr. Nind said that the letter was very valuable, and that it should be printed and distributed to members.

The President said that as further information was expected from Jamaica, it would be better to wait and get the letters from both sources printed together.

On the motion of Mr. Drysdale, seconded by Mr. N. D. Davis, a vote of thanks was unanimously accorded to Dr. Nicholls.

The Secretary read a letter from Mr. Jenman enclosing a copy of a photograph of Dr. Richard Schomburgk.

It was suggested that an enlarged copy be made to be placed in the Reading Room beside that of his brother.

Mr. Vyle exhibited several of the new telephones, and explained the mechanism of the instruments. He also showed some specimens of faulty connections lately taken from the old wires, which tended to increase the resistance to the current to an enormous degree. He objected to the old wires being put in connection with the new telephones, and spoke in favour of new copper wire.

Mr. Tinne said that Mr. Barr and himself had been appointed by the Commercial Committee as a sub-committee on the Telephone Exchange, and, therefore, he was very much pleased to hear Mr. Vyle's explanation; he then moved a vote of thanks to Mr. Vyle, which was seconded by Mr. Conrad and carried.

The meeting then terminated.

Meeting held on the 21st February.—G. H. Hawtayne, C.M.G., C.M.Z.S., F.R.G.S., President, in the chair.

There were 19 members present.

Elections.—*Members:* Jas. W. Johnson, G. W. Rockcliffe, H. H. Cunningham, T. St. Felix Daly, W. Cameron, John Cheong, Dr. C. Fisher, Wm. Crosby, David Gibson, Wm. Chalmers, C. G. Perot, B. Chatterton, Henry Collier, and the Hon. C. B. King.

Associates: R. H. McBurnie, J. A. Coelho, Augusto Fernandes, H. Bowen, Chas. Haynes, J. F. Stow, C. O. Rainer, H. de Rune Barclay, A. M. Abbott, Jas. Simpson, R. D. King, W. G. Smellie, A. J. Collier, D. L. Hutchinson, J. Bratt, J. W. Craig, J. W. de Wever, R. B. Garratt, W. F. Reeves, Angus McKay, B. Bleau, and J. C. King.

The Secretary read the Report of the Librarian for 1888, which had been referred to the meeting by the Board of Directors.

The President stated in reference to the suggestion as to the admission of temporary visitors to the colony as subscribers, that the Directors had come to the conclusion that it was not desirable to lend books to mere transient visitors, as there would be no certainty as to the works being returned.

Mr. Vyle said that this might be made a source of revenue, and a guarantee could be got from strangers.

Mr. Nind thought the Society was acting with sufficient liberality in allowing strangers the use of the Reading Rooms, and if books should be lent to them, there might be mutilations which the Librarian would not be able to identify or obtain compensation for dam-

age or loss. He agreed with the Directors in their decision and thought them wise in acting as they had.

The Secretary read the Report of the Curator of the Museum for 1888.

The President said that this Report had been considered at some length by the Directors, who were most anxious to do all they could to assist Mr. Quelch in carrying out his views. They had appointed a sub-committee to consider the ways and means of executing his suggestions. They did not consider it advisable to mix up the Museum with a Picture Gallery. It was important that Mr. Quelch should be provided with a room in which he could conveniently carry on his work, as he was seriously hampered by the meagre accommodation he had at present. The Committee hoped that with the assistance of Messrs. Luke Hill and Conyers they would be able to see what was best to be done.

Mr. Tinne mentioned that the Russell Memorial Committee were very uncertain as to the shape of the proposed memorial; and asked whether an extension of the Museum would not be more suitable than a statue in front of the Market?

The President remarked that this would be very appropriate, and Mr. Davis said that it could be called the Russell Wing.

Mr. Tinne observed that the Government had promised \$5,000 towards the Russell Memorial, and many persons who were willing to contribute had been enquiring as to what the Committee were going to do. He suggested that the Secretary of this Society should write to the Memorial Committee to propose its co-operation with the Society. This being unanimously

agreed to, the Secretary was directed to communicate accordingly.

Mr. Nind moved that the Directors be empowered to draw up plans and estimates for an extension of the Museum, to be submitted to the Government, together with the suggestion of Mr. Tinne that it should be made the memorial of the late Mr Wm. Russell.

On the motion of the President, Mr. G. H. Richter was unanimously elected as their Exchange Room Director, in place of Mr. C. Weiting, resigned.

The motion having been seconded by Mr. W. Cunningham, it was carried unanimously.

The Secretary laid on the table a Statement of the Accounts of the Museum and Buxton Exhibition up to December 31st, 1888.

The Secretary read a letter from the Committee of Correspondence in regard to the matter of cable communication referred to that Committee, suggesting that it should be referred to the Commercial Committee, which was done accordingly.

The Secretary read the following report from the Commercial Committee, giving a *résumé* of the work done during the two preceding months.

I have the honour to report that, since the last meeting of the Royal Agricultural and Commercial Society, the Commercial Committee has held six General and several sub-Committee meetings, and the following is a *résumé* of the business that has occupied its attention : —

1.—The Revision of the Customs Tariff.

At the request of His Excellency the Lieutenant Governor in a letter dated 8th January, 1889, No. 8875, the Committee was requested to revise the existing Customs Tariff. In accordance with this request the different items on the same were divided into classes, and Committees were appointed to consider each. Their various reports have been sent in and approved of by the General Committee, which has added a Compara-

tive Statement of the probable revenue to be derived from this source, as compared with 1887 and 1888, and the whole has been compiled and arranged in book form as per proof herewith submitted, and will be ready in a day or two. The Committee recommends that the members of the Combined Court be supplied each with a copy.

2.—The New Telephone Service.

This matter has been carefully considered, and His Excellency and the Honourable Members of the Court of Policy informed of the Committee's views on this most particular subject.

3.—The Official Prices Current.

No. 3 of the Prices Current has now been issued, and a copy of each herewith submitted for your approval.

4.—Marine Insurance.

The following question of Marine Insurance may be interesting to the general public; the decision of your Committee is herewith appended.

A cargo of Coals is consigned to A and covered by Insurance. On its arrival here a portion of the cargo is sold to B at so much per ton free from alongside. B sends his lighters for the portion of coal which he has purchased; one of the lighters in going ashore with a load of coal sinks, and the coal is lost. Query: Are the underwriters of A responsible for the lost coal?

After careful consideration the Committee was of opinion that the underwriters of A were liable for the lost coal.

5.—The charge made by local Banks on Bills of Exchange sold by them.

In connection with this matter the following resolution was submitted to the Government, viz:

"That in view of the local banks exacting stamps, on Bills of Exchange sold by them, from the buyers, contrary to the intention of the Stamp Act, the Government be requested to raise the licence on Banking establishments as per Tax Ordinance from \$500 to \$2,000 per annum."

6.—The Tax on Insurance and Assurance Agencies.

It was proposed that a tax based on the percentage of the premiums received (and calculated so as to raise an equal revenue) be charged, instead of as at present taxing all Insurance and Assurance Agencies the sum of \$250 per annum, irrespective of the extent or magnitude of their business.

7.—Marine Sub-Committee.

A Marine sub-Committee has been appointed, whose duties are to

consider all questions arising between Captains of vessels coming to this Port and their Consignees.

8.—The Stamp Duties.

In connection with this subject the following resolution was carried and forwarded to His Excellency the Lieutenant Governor and the Honourable Members of the Court of Policy:—

“That this Committee recommends the abolition of the present Stamp Tax on Bills of Exchange, Promissory Notes, Cheques, and Receipts.”

9.—The New Opium Ordinance.

The suggested additions to, and alterations in, the draft of the proposed new Opium Ordinance are herewith attached, and copies of the same have been forwarded to His Excellency and the Honourable members of the Court of Policy to-day for their consideration and approval.

In addition to the foregoing, your Committee has had under consideration the present state of the Receiver General's department, particularly the unnecessary and unaccountable delay experienced by all parties who have occasion to pay in or receive monies. A change in these matters is most urgently required.

The necessity of having the New Harbour Ordinance pushed through without delay has also been pointed out.

WILLIAM CUNNINGHAM,
Hon. Secretary.

The President said that the report showed that the Committee had been very industrious and energetic.

After some discussion, in the course of which Messrs. Tinne and Julius Conrad hinted at objections to two of the decisions of the Committee (sections 4 and 5), Mr. Nind called attention to the fact that the Banks in this colony were permitted to redeem their notes in silver, which might give rise to great inconvenience and loss under certain circumstances, and hoped the Commercial Committee would use their influence to introduce a gold standard. Major Walthall was glad to find that the Committee had established a body to which questions between Masters of vessels and their consignees could be

referred, as he had experienced some difficulty in obtaining information as to the custom of the port in certain cases.

Mr. Tinne thought that the thanks of the Society were due to Mr. Cunningham for the great trouble he had taken with the revision of the Customs Tariff; his labours had been interminable in working out the details.

In answer to a question of Mr. Vyle, the President informed the meeting that the Commercial Committee could correspond with any of the other Committees, or with the Government direct, without the delay of a previous reference to a meeting of the Society.

Mr. Davis brought forward the motions for premiums, of which due notice had been given. After a lengthy explanation with regard to No. 4, in the course of which Mr. Davis said that he had learnt that the Planters' Association had taken the matter of immigration from Madeira, &c., into their consideration some years ago, but owing to the depression which came on afterwards the matter had been allowed to drop, the motion was withdrawn. No. 3 was also withdrawn for the present on account of the probability of Government making arrangements for a larger subsidy to the Banana trade than that already voted. No. 2 having been found by Mr. Davis to be provided for in connection with the Museum in the bye-laws of the Society, was rendered unnecessary. Mr. Davis then formally proposed his motion, No. 1, with slight alterations as follows:—

That \$50 be paid to the person who, during the year 1889, shall be the first to build at any place within the colony, a Kiln for drying Indian Corn, such sum of \$50 to be paid on the award of the Commercial Committee.

In making this motion Mr. Davis said, that there had

been an average importation annually during the last three years of 20,000 bushels of corn of the value of something like \$16,000. This could be easily grown in the colony, and if properly dried would be as good as, or perhaps better than, the imported article.

Mr. Conyers seconded the motion, which was duly carried after some discussion, in the course of which Mr. DaCosta and Mr. Nind spoke of the difficulty of keeping creole corn for more than a day or two on account of its not being properly dried.

The Secretary read a letter from the Government Secretary asking the Society for information as to Agriculture, &c., for the more exact compiling of the Blue Book for 1888. The matter was referred to the Agricultural Committee.

The Secretary read a letter from Mr. DaCosta referring to specimens of Matches and Match-boxes exhibited to the meeting, and made from two kinds of colony wood, which had been found to be highly suitable for the purpose. Samples, mounted on a card, of the various stages of the manufacture, had been presented by Mr. Da Costa for Exhibition in the Museum, by the desire of the Curator.

The President thought that Mr. DaCosta deserved a vote of thanks for creating this new local industry, which vote was accorded unanimously.

The thanks of the Society were given to Mr. Wm. Tebb for his donation of copies of "The Story of a great Delusion," and "The New Catholic Church."

The meeting then terminated.

Meeting held on the 21st March.—G. H. Hawtayne, C.M.G., C.M.Z.S., F.R.G.S., President, in the chair.

There were 11 members present.

Elections.—*Members:* Messrs. D. M. Hutson, A. W. Oldfield, R. J. McGowan, F. C. Walrond, and Capt. Porter.

Associate: Mr. F. Le Keux.

The President stated that Mr. Luke M. Hill, the Hon. Secretary, was unable to attend on account of the injuries he had received in the late riots.

Mr. Davis thought they ought to express their sympathy with Mr. Hill, and also their appreciation of his services in the cause of order, in which the President and meeting concurred.

The Assistant Secretary read the minutes of the previous monthly meeting, which were duly confirmed and signed.

The President, on behalf of the Board of Directors, stated that a sub-committee had been appointed in the matter of the proposed extension of the Museum, who had drawn up a petition to the Combined Court for a grant of \$12,000 for that object.

Mr. Davis thought it would be a graceful act on the part of the Directors if, under present circumstances, they withdrew the petition, as on account of the unforeseen demands on the colony it might be rejected.

It being the opinion of the meeting that it was desirable to obtain the views of the Combined Court on the matter, it was allowed to stand.

The President read a letter from the Secretary of the Committee of Correspondence, informing the meeting that the proposed Exhibition at Buxton had been post-

poned until the early part of August next, on account of the want of interest on the part of the classes concerned, and the unfavourable weather for agricultural purposes.

The President read a letter from Mr. R. J. Kelly, Chairman of the Russell Memorial Committee, in answer to the proposal of the Society that a new addition to the Museum should be built and called the Russell Wing. "The Committee were unanimously of opinion that they could not deal with the suggestion, their final report in favour of a Drinking Fountain having been submitted to the Government and accepted."

The President read the following letter from the Secretary of the Jamaica Society of Agriculture and Commerce in answer to enquiries as to the packing of fruits for shipment:—

Dear Sir,—Some delay has occurred in obtaining the information sought in your letter on the handling of Fruit for shipment.

I have been referred to a publication on Orange Culture in Florida; by Rev. T. W. Moore, New York, E. R. Pelton & Co., 25, Bond Street.

I have also been favoured, by a large and most trustworthy shipper, with remarks, the result of practical experience, which for convenience of reference, I annex on other leaf.

I trust that these may be of use, and intend, if I can learn anything of Bananas, to address you again.

RICHD. HITCHINS.

RULES FOR SHIPMENT OF ORANGES.

1st. They should be carefully hand-picked, not allowed to drop on the ground which would injure the fruit.

2nd. They should be put on shelves in a drying room after being stem-cut, and left for four days before being wrapped in paper, to dry, and show rot, if any.

3rd. Each orange to be wrapped in paper.

4th. Pack in barrels or boxes, in layers, tightly,

In Jamaica, barrels are principally used for shipping oranges, but boxes would answer much better, and I think would sell to better

advantage, provided the fruit be put up in different sizes, in other words, sampled.

MEMO.—I am informed that the packages should have apertures for ventilation—auger-holes or pieces of staves chipped out—and be kept cool.

R. H.

A vote of thanks was given to Mr. Hitchins, and the information ordered to be printed, together with that of Dr. Nicholls, Dominica, on the same subject, and distributed to persons interested.

Mr. Nind exhibited a sugar bag made from leaves of the screw pine (*Pandanus*), which he thought could be easily made in the colony very cheaply. It had been made by a coolie that morning under his direction, and he thought there would be no difficulty in procuring the material or in the manufacture of a better article than the specimen.

Mr. Nind received the thanks of the Society for a copy of the pamphlet, "Vegetable Resources of the West Indies."

The President read the following reports of the Commercial Committee for the previous month:—

I have the honour to report for the information of the members of the Society, that, since the last monthly meeting, the Commercial Committee have held one Special, and four General meetings, and the following is a resumé of the business that engaged the attention of your Committee.

1st. Mr. G. Richter having been elected a director of the Exchange Room (in place of Mr. C. Wieting resigned) *ex officio* became a member of this Committee.

2nd. The Importation of Dynamite, &c.—The following resolution in connection with this matter was passed, and a copy of the same forwarded to the Government:—

"That this Committee recommends to the Government the removal of the present prohibition against the importation of Dynamite, Gun Cotton, and Lithofracteur."

3rd. **The Polarization Question.**—This important subject has had particular attention, and the following resolution has been forwarded to His Excellency and the Honourable members of the Court of Policy, viz. :—

“That looking to the importance of accurate Polarization of Sugars, dealt with in our trade with the United States and elsewhere, and the advantage of having reliable tests at a fair yet moderate cost, this Committee recommends to the Government to establish a class of Sworn Licensed Polarizers, somewhat on the lines of the Weighers and Gaugers, and that a sum not exceeding \$1.20 be the charge for each test, with a certificate thereof.”

4th. **Clerical assistance for the Commercial Committee.**—The following resolution for paid clerical assistance was forwarded to the Hon. Secretary of this Society, and refused by the Directors.—

“That paid clerical assistance to the extent of \$40 per month be voted from the funds of the Royal Agricultural and Commercial Society of British Guiana to this Committee.”

5th. **The Tax Ordinance No. 6 of 1888.**—In connection with this, the following questions have arisen :—

(i.) What is the meaning of the words (in Tax Ordinance No. 6 of 1888, section 38) “drawn or expressed?” Is the “expressed” explanatory of “drawn?”

(ii.) If so, should stamps be affixed to Bills of Exchange not payable or negotiable in the colony?

After careful consideration, and a good amount of discussion, the following resolution was forwarded to the Government :—

“That in the opinion of this Committee (on reference to the Colonial Taxes Ordinance No. 6 of 1888, section 38) Bills of Exchange drawn within the colony but *not* negotiated therein, are not liable for Stamp duty.”

6th. **Vote of thanks to the Hon. John Macdonald, of Toronto, Canada.**—

“That this Committee begs to thank the Hon. John Macdonald, of Toronto, Canada, for his efforts to promote a more friendly feeling and to establish closer business relations with this colony and Canada.”

7th. **The Banana Question.**—Herewith attached are Capt. White's replies to the various questions of this Committee anent this important question; and the following is the consensus of opinion collated from the different correspondents who have replied to the circulars issued by this Committee :—

1. That Bananas are usually planted 12 feet apart, 300 plants to an acre.
2. That they take on an average 12 months to mature.
3. That the loss from various causes is about 20 per cent.
4. Not more than 60 per cent. bear 8 hands and over, 40 per cent. under 8 hands.
5. Bananas mature at all seasons of the year.
6. That the average cost, taking 5 years, is from \$40 to \$45 per acre.
7. Transportation and Freight from 1 cent to 2 cents per bunch, Demerara River, but by Rail or Steamer from 4 to 5 cents per bunch.
8. Bananas would pay all round, large or small bunches, at 25 cents per bunch.
9. Bananas would keep from 8 to 10 days; but no actual experiments were quoted by any of the correspondents.

After considerable discussion the following resolutions were carried:—

“ That it is the opinion of this Committee that Bananas cannot be profitably grown at the prices offered by Mr. Rogers.”

“ That the minimum price fixed by any contract should be equal to the cost of production, plus amount of subsidy paid.”

In addition to these matters, your Committee have considered the present arrangements of the departure of the Royal Mail Steamers, have issued the usual Prices Current, and, in connection with the recent disturbances in this city, waited upon His Excellency and pointed out the great loss the Mercantile community has sustained, urging prompt and immediate action in suppressing the same.

The question of forming a Chamber of Commerce has been brought up and will be reported on in our next.

WILLIAM CUNNINGHAM,
Hon. Secretary.

*Captain White's Replies.**

1. The plants should be 8 feet apart, and there will be 400 to the acre, but if 12 feet apart, two suckers can be planted in each hole. This will give over 400 plants; and most people favour this way of planting, it being specially adapted both to our soil and climate.
2. 11 to 12 months.

* The answers to most of these questions are framed from information received from Farmers and Planters in the last two years.

3. Not over 5 per cent., as Banana plants have good strong roots, and we are not troubled here with high winds as in other places.
4. If the plants are properly cultivated and well cared for, 75 per cent. will be full 8-hands, the other 25 per cent. will run from 7 to 5 hands.
5. In this climate, yes.
6. Not over \$40.00 per acre; and after the empoldering and drainag is done, \$30 is the outside cost.
7. This depends entirely on where the Bananas are grown. There is no doubt that the river lands will be the favourite places, and as our rivers are navigable for so many miles, the steamers would run up alongside of the plantations. This is a facility that no other part of the Banana growing world has, and hence our fruit could be shipped with small expense and very little handling.
8. Owing to our facilities for shipping all along the river, it should not cost over 2 cents per bunch.
9. As the steamers could steam along the river and stop in front of the plantations, there would be no trouble of shipping direct from the farms, and should the business grow to any great extent, the large plantations would no doubt run out jetties for the steamers to lay alongside; in this case bateaux from the smaller farms would come alongside.
10. I have seen Bananas landed from steamers both in Baltimore and New York, after being on board six days, in excellent condition—in fact not yet ripe, and those were by transient steamers that were not fitted up expressly for the trade.
11. I do not know how many bunches Jamaica ships per annum, but this I do know, that the third year after the subsidy was granted, Jamaica received £193,000 sterling for her fruit alone, and last year she received £225,900 sterling. This money is brought by the steamers in cash and distributed all round the Island.
12. The Port of Savannah being 1,892 miles, the steamers purposed for this route, they being 16 knots boats, will cover the distance in a little less than 5 days, and I would here mention that the authorities of the Savannah and Georgia Railroad running through to the West have offered Mr. Rogers every facility for the transportation of the fruit. This carries our fruit direct to the Western States where few Bananas have yet gone.
13. The very fact of Mr. Rogers going to the expense of bringing 200,000 plants to the colony and distributing them gratis to the Farmers and Planters at a cost for the plants alone of \$6,000.00, and then waiting 12 months and returning to the colony to purchase the fruit and

receiving no part of the subsidy until he has run, bought and carried the fruit for twelve months, I think is sufficient guarantee that he will put on not only the fastest steamers, but ships thoroughly adapted for the preservation of the fruit.

14. The quality of the bunches would speak for themselves and no other arrangements are needed.

15 and 16. It would be possible to charter a steamer for one year, but certainly Mr. Rogers would not undertake any such experiment, even though guaranteed by the Government against loss. Admitting for argument's sake that Mr. Rogers would do so, the people here would have no faith in it, and would not invest their means in the cultivation of this fruit just for an experiment. Then how could the fruit be obtained? The Company no doubt could be formed here under a Government guarantee, but the people would have no faith in it, and when it is considered that the entire fruit business in the United States is in the hands of rich syndicates, how is it proposed to sell the fruits? This I consider is quite impracticable.

E. T. WHITE.

In reference to the Committee forming a Chamber of Commerce, Mr. Nind expressed his opinion that it would be a good thing, as at present it held a rather anomalous position.

In the matter of the proposal to allow the importation of dynamite, &c., Mr. Davis said that these explosives were necessary to the proper working of gold mines, and its storage and sale could be properly regulated to prevent misuse.

Major Walthall was glad to find that the Committee was doing something towards arbitrating in matters of mercantile marine.

Mr. Julius Conrad approved of the action of the Directors in refusing a grant for clerical assistance to the Committee, as they would the sooner have to form a Chamber of Commerce, the scope and influence of which would be so much greater.

Mr. Cunningham informed the meeting that the Com-

mittee had appointed a Marine Sub-Committee, and stated that in the matter of underwriters' liability for loss of coals, referred to in last month's report, the decision of the English authorities had been contrary to that of the Commercial Committee.

The meeting then terminated.

Meeting held on the 18th April.—D. C. Cameron, Esq., Vice-President, in the chair.

There were 17 members present.

Elections.—*Members* : Rev. A. H. Leslie, Hon. J. W. Carrington, Hon. C. L. Bascom, Mr. Chas. Robertson, and Rev. J. E. Peel.

Associates : M. L. Da Costa, Thos. Dalgleish, A. Pinedo, R. M. Jones, R. McIntosh, R. W. Hubbard, Jun., and McDonald Hurley.

The Secretary reported that in the absence of the President he had been requested to inform the meeting that Mrs. Matilda Williams had presented the Society with the handsome donation of £50. Her late husband, Mr. Thomas Williams, had possessed some estates in Berbice, which devolved to the administration of Mr Hawayne's office, and gave a great deal of trouble. They were eventually sold, and Mrs. Williams was disposed to give part of the proceeds to some public object in the colony. Having been informed that funds were required for the extension of our Museum, that lady had generously forwarded the amount for this object. It was proposed by the Chairman, and seconded by Mr. R. P. Drysdale, that a cordial vote of thanks be given to Mrs. Williams for her handsome donation. This was unanimously carried, and the Secretary was directed to forward the thanks of the Society to that lady.

Mr. Quelch stated that Mr. George Garnett had promised to present a wall case to the Museum provided some other promises could be obtained.

The Chairman thanked Mr. Garnett in the name of the Society.

The Secretary read the following Report from the Agricultural Committee in answer to the request of the Government for Agricultural Statistics for the Blue Book :—

AVERAGE RATE OF WAGES FOR LABOUR IN TOWN AND COUNTRY.

	Per Annum.	Per Day.
Domestics—Males (Paid monthly) ...	£20 to £30	—
Females ,, ... £10 to £20		—
Tradesmen—Carpenters ... — ...		2/6 to 3/
Masons — ...		2/6 to 3/4
Smiths — ...		3/- to 3/4
Coopers — ...		3/6 to 4/-
Boatbuilders — ..		4/- to 5/-

Remarks.—The above are Country rates ; in Town the rates are generally 20 % to 25 % higher.

AVERAGE RATE OF WAGES FOR LABOUR ON SUGAR ESTATES.

Pradial—	Per Day.	Manufacture	Per Day
Cane-cutters ... 2/- to 4/		Clarifiers, Headmen	3/- to 3/6
Shovelmen ... 1/- to 2/		Do. other than Do.	1/4 to 1/8
Weeders ... 10d. to 1/4		Distillers (including Headmen) ...	1/4 to 4/2
Suppliers ... 1/6 to 2/6		Others about the	
Puntmen ... 1/4 to 2/-		Buildings 	8d to 1/6
Manufacture—		Tradesmen—	
Cane-throwers * ... 1/- to 1/4		Engineers† ...	2/8 to 4/2
Boilermen ... 1/6 to 2/-		Carpenters† ...	2/8 to 3/-
Firemen ... 1/6 to 2/6		Masons† ...	2/8 to 3/4
Sugar-curers ... 2/- to 3/-		Coopers ‡ ...	3/- to 4/-
Boxmen ... 1/8 to 2/-			
Megass-carriers ... 1/2 to 1/4			

* Mostly done by Coolies. † Headmen generally paid monthly.

‡ Generally paid by task.

Remarks.—As a rule a good strong black man can earn 50 % more at cane-cutting than an ordinary coolie, one of the reasons being that his cutlass is always in better order.

IMPROVEMENTS IN AGRICULTURE AND MANUFACTURES.

The Manufacture of Sugar.—During the year 1888 considerable improvements in Sugar Machinery were instituted, principally in the direction of evaporating appliances. Two quadruples and two triples of the Yaryan type, the Rillieux system and combined multiple effets and pans, and several multiple effets of the ordinary triple were erected and worked with more or less success. But perhaps the greatest advance of the year consisted in the establishment on a sound basis of the diffusion process for the extraction of sugar from the cane, the many difficulties which had cropped up from time to time in its adoption having been successfully overcome. In connection with the above, general improvements in the direction of arrangement of buildings and economy of fuel and labour were largely carried out. The bulk of the sugar made was for the American market, but where yellow crystals were made, the use of phosphoric acid in clarification was largely and successfully extended.

GEORGE GARNETT,
Hon. Secretary.

It was proposed by the Chairman, seconded by Mr. Davis, and duly carried, that the Report be forwarded to the Government.

Mr. Quelch gave a short account of his late trip up the Essequebo and Potaro, to the Kaieteur Falls, reserving fuller details for publication in *Timchri*.

Mr. Davis asked the Secretary if he had received any enquiries as to the premium for the corn kiln, to which Mr. Hill replied that he had been asked privately for information by a person who thought of erecting such a kiln up the Demerara River.

The Secretary read a letter from Mr. Cunningham excusing himself from forwarding the usual report of the

Commercial Committee, on account of a press of other work.

The thanks of the Society were presented for the following donations from Mr. G. C. Wyatt:—1 vol., Kolb's "Condition of Nations," 2 Railway Maps, Great Britain and Ireland.

Captain E. T. White called attention to what he considered a misleading sentence in the last Report of the Commercial Committee as published by the newspapers. The statement was made that, "herewith attached are Captain White's replies to the various questions," these replies not being attached or published, but other quite different answers which might be considered, on a casual examination, to be his.

On examination of the minutes of the previous meeting it was found that Captain White's replies had not been annexed to the Report; but an entirely different document. Mr. Cunningham, the Secretary of the Commercial Committee, explained the inadvertency, and it was ordered that the replies of Captain White should be published in *Timehri* together with the Report.

Mr. Cunningham informed the meeting that the draft articles and bye-laws of the proposed Chamber of Commerce were printed and under consideration.

The Chairman said there was no doubt that a Chamber of Commerce was desirable. The principal difficulty was in the matter of subscriptions. The Commercial Committee, as an offshoot of the Society, had done a great deal of work, and he hoped that if changes were made they would be for the better, as it was certain that some such body was necessary.

The meeting then terminated.

Meeting held on 16th May.—G. H. Hawtayne, C.M.G., C.M.Z.S., F.R.G.S., President, in the chair.

There were 11 members present.

Elections.—*Members:* G. V. Hughes; W. B. Kerr, and M. H. Simpson.

Associate: Peter de Wever.

The Treasurer laid over the annual list of members who had not paid their subscriptions. Notices had been duly sent to them, and as no answers had been received, there was nothing left to be done except to strike their names from the list of members.

The President on behalf of the Board of Directors reported that Mr. Quelch, the Curator of the Museum, had applied for leave of absence. Three months' leave had been granted, with permission to apply for an extension.

The Secretary read a Report of the Commercial Committee as follows, which was duly taken for consideration:—

I have the honour to report to the Society that the Commercial Committee have held five general meetings, and herewith I submit a resumé of the business that has occupied your Committee's attention.

1st. "Cable Communication."—Mr. Vyle's paper on this subject, in the June issue of *Timehri* (1888), was (in accordance with the request of the Committee of Correspondence) taken up and discussed, and two letters from the Agent in this colony of the West India and Panama Telegraph Company on this matter, were brought before this Committee.

For general information it may be stated that Mr. Vyle advocates a direct Cable between Demerara and St. Vincent, Cape de Verdes, connecting with the duplicate lines from Great Britain to Pernambuco, now existing. The distance from British Guiana to Cape de Verdes is about 2,000 knots, and the cost of laying the cable would be about £250,000 sterling. It is estimated that were this carried out, the cost per word of messages would be about 7/6, a great difference from our present rates, and telegraphically we should be as near London as we are to Suddie.

The West Indian and Panama Company undertake to lay a new Cable between this colony and Trinidad and maintain the old one, for a payment of £1,500 sterling per annum for 10 years, in addition to the present subsidy of £4,500 sterling.

After various other suggestions and considerable discussion the resolution was carried (8 for, 1 against, and 4 members declining to vote), viz. :—

“ That this Committee suggest to the Government the desirability of communicating with the Imperial Government as to the laying of a Cable through British territory from England to British Guiana.”

3rd. “ Lloyd's letter anent 'Surveys' and fees chargeable for same.”

A Committee was appointed to go into the matter and their report has not as yet been sent in.

3rd. “ The British Guiana incorporated Chamber of Commerce.”

Herewith I forward the draft Memorandum and Articles of Association and Bye-laws, of which up to page 5 has been corrected by your Committee. The book has been sent in to shew the lines on which the proposed Chamber of Commerce intends to work.

4th. The Hon. Mr. Tinne having left the colony, the Hon. Alex. Barr was unanimously elected Chairman of this Committee.

5th. Messrs. John S. Hill, George Garnett, W. H. Sherlock and A. Summerson, have replaced Messrs. W. W. Birch, M. Garnett, E. Tinne, and T. H. Glennie, who have left the colony.

6th. “ The Polarization question.”

Attached is the copy of the Minute by the Government Analytical Chemist anent this subject, and a copy of your Committee's reply to the same. This deserves special attention at your hands.

7th. “ Change of Meetings.”

The weekly meetings had, on account of the departure of the Royal Mail Steamer (recently on Saturday mornings), to be changed to fortnightly meetings.

WILLIAM CUNNINGHAM,
Hon. Secretary.

Minute by Government Analytical Chemist.

As an Analyst I, of course, consider the interests of my profession to be of paramount importance, and, as the polarization of sugar samples falls within the legitimate practice of an Analyst, I view the proposals of the Commercial Committee of the Royal Agricultural and Commercial

Society to establish a class of licensed Polarizers with as much disfavour as would a Surgeon, for instance, the establishing of a class of "bone-setters," or as the members of any other profession would the licensing of any similar kind of interlopers.

As a Government servant I am of opinion that the matter is not of sufficient importance to be made the subject of legislation. From an experience of several years, I estimate that the number of samples required to be polarized annually for business purposes in the colony does not exceed one thousand, and it seems hardly worth while to create a class of specialists to share the thousand dollars or so that would result from the performance of the work at the reduced fee.

Granting, however, that the matter is worth legislating upon, the Government would have, I think, great difficulty in giving effect to the Commercial Committee's resolution. Many persons are unable to read a polariscope correctly owing to defective sight, therefore, before granting a licence it would be necessary to ascertain that the applicant was fit to do the work, and examiners would have to be appointed for that purpose. But a professional polarizer should not only be able to do the necessary manipulations, and read his instrument, but should be able to assure himself that his readings are right. Few polariscopes of the kind used in the colony are quite correct, and many are largely in error; of two instruments now in the Government Laboratory one gives readings $\frac{1}{10}$ and the other $\frac{5}{10}$ of a per cent. too low at the 96th division or standard for sugar shipped to the American Market. All the other apparatus used in polarizing—scales, weights, measuring flasks and polariscope tubes—may be, and frequently is incorrect, especially the flasks and tubes. In my Annual Report for 1886 I showed that one of the measuring flasks that I examined, amongst a number of others, all incorrect, was so badly graduated that it would cause an error of $\frac{7}{10}$ of a per cent. in the testing of a sample of sugar. This large error was simply caused by the flask holding 5 fluid grains of water more than it should have done. Polariscope tubes should be exactly 200 millimetres long, but they also are frequently inexact and a single millimetre or $\frac{1}{16}$ of an inch excess or deficiency causes an error of a half of one per cent.

All the amateur polarizations in this colony are done without regard to these points—the accuracy of the apparatus being taken for granted—and if they happen to turn out right it is merely by accident. In establishing professional polarizers it would be necessary, therefore,

either to provide for the standardizing of the instrument or to issue such instructions as would enable the polarizers to do it themselves. I fear, however, that the latter would be beyond the capacity of those likely to engage in the work. The most difficult of the operations would be standardizing the polariscope. The only reliable way of doing this is by means of pure sugar. This cannot be bought; it must be specially prepared by a tedious process, and be subsequently analysed to determine that it is pure.

For the results of the licensed polarizers to be of equal value, the polarizations would have to be conducted in a uniform manner. The particular kind of balance, polariscope, filtering apparatus, and general treatment of the samples would have to be defined and strictly adhered to. The polarization of ordinary refining crystals might then no doubt be carried out satisfactorily. But it unfortunately happens every now and then that samples, particularly of molasses, and molasses sugar, are received, for which the usual treatment does not suffice, and which often tax to the utmost the skill and experience of the Analyst. Over such samples the mere mechanical Polarizer would assuredly come to grief. To support my statements, I forward Landolt's handbook to the Polariscope—the standard work on the subject—directing attention to page 155 and the following ones, which treat of optical saccharimetry.

E. E. H. FRANCIS.

27th March, 1889.

Reply of Commercial Committee.

In reply the Committee desire me to point out to His Excellency and the Honourable members of the Court of Policy:—

1st. The Polarization of Sugar is not a professional chemical process, but simply a mechanical one, requiring in the first instance a correct instrument and appliances; in the second, a careful manipulation of the exact quantities of Sugar and Water necessary, and correct eyesight.

2nd. Sugar has been correctly polarized by other than Analytical Chemists, and is daily so done. The only reason why, heretofore, the Government Chemist has been employed, is because in the absence of Sworn Polarizers, his position has been acceptable to both buyer and seller, but the high rate charged by him makes it desirable that men who are acceptable to both parties, and who are willing to Polarize at

lower rates, should be appointed. In the United States each sample of Sugar is polarized by two men whose mean result is taken as the basis of settlement, and the charge for each sample is only 60 cents.

3rd. The question as to the annual amount derived from Polarization Fees does not concern this committee. Many more samples would be polarized if the fee was reduced, and Polarizers of Sugar might be men who have other means of subsistence.

4th. The Government Analytical Chemist might well be called in where the teaching of Polarization was required, together with the testing of instruments, and the granting of certificates to qualified persons to polarize Sugar—for all of which he may be allowed to charge a fee.

5th. As a matter of fact, Polarizers differ considerably in their tests, and the Government Chemist has been no exception to the rule. Circumstances, such as weather, affect Sugar, and samples from the same cargoes taken in dry weather, varied considerably when tested during heavy rains.

6th. It cannot but be expected that the appointment of Sworn Polarizers, equally acceptable to buyer and seller, will reduce to a large extent, the present income of the Government Chemist, received for private (professional?) work, such as the Polarization of Sugar, and naturally he is against the representations of this Committee as to the necessity of such appointments.

WILLIAM CUNNINGHAM,

Hon. Secretary.

The President reported having received two further donations towards the extension of the Museum and its fittings, viz.:—Mr. John McConnell, £50; Mr. Stewart Gardner, \$100.

The thanks of the Society were heartily accorded for these donations, and the Secretary directed to communicate the same to these gentlemen.

The Secretary read a letter from Mr. J. S. Da Costa asking for information as to the construction of a corn kiln, for which the Society offers the premium, also another letter from Mr. A. Shanks to the same effect.

Mr. Luke Hill said that he had sent a sketch which he had made to Mr. Shanks.

The President asked Major Walthall whether he could procure the required information for the Society through the United States Minister of Agriculture, to which the Major replied that he would write to that official.

Mr. Coronel gave notice of motion as follows:—

That the Society ask the Government to establish the Government Laboratory on such a footing that any person may obtain an analysis of food, of a qualitative kind, for a small fee (say 48 cents), in the same manner as is done in the neighbouring French colonies.

Mr. Coronel asked that the Book Committee should make provision for French readers as well as English, by ordering for the Library a selection of the best authors. The Chairman intimated that Mr. Coronel was at liberty to propose what French books he thought suitable, when he had no doubt the Book Committee would take the recommendation in the same manner as is usually done.

Major Walthall asked whether ladies were eligible for membership of the Society, and, if not, whether there were any rules that excluded them. He wanted the information for a lady, and being a new member he was not fully acquainted with the rules of the Society.

The Secretary replied that ladies were allowed the use of the Library as subscribers, but were not permitted the privileges of full members. As a matter of courtesy they were allowed the use of the Reading Room.

Mr. Davis did not think that there were any rules that amounted to a prohibition; and Mr. Garnett could not see anything in the laws as to whether members should be male or female.

The President said that it might be inferred from the

bye-laws, chap. v., art. 16, that it was not intended to admit ladies as members, but if Major Walthall wished an expression of opinion, he might give notice of a motion to the proper effect.

Major Walthall said there were two objections to his making a motion, first, to do so would imply that ladies were not eligible, which does not appear proven, and second, he was not sufficiently experienced as a member to carry the matter through.

Mr. Davis informed the Society that he had heard that two of our staple products were likely to be more enquired for in the home markets, rum being lately recommended by doctors in place of whisky, and cane sugar having been found much superior to beet for the preparation of chocolate.

The President exhibited some specimens of Carib pottery, and minerals forwarded to him from the Grenadines, to be presented to the Museum.

The meeting then terminated.

Meeting held on 13th June.—G. H. Hawtayne, C.M.G., C.M.Z.S., F.R.G.S., President, in the chair.

There were 11 members present.

Elections.—*Members:* Messrs. W. H. Woodroffe and J. C. Forbes.

Associates: Messrs. F. P. Rogers, C. Francis, H. W. Hunter, and Oscar W. Weber.

Mr. Coronel brought forward his motion, of which due notice had been given, that the Society recommend to the Government, that the Government Chemist should analyse food for any person, on payment of a small fee.

In introducing the motion Mr. Coronel stated that there had been a feeling among the black people since the riots, that the Portuguese were selling food that was not wholesome. He did not think the shopkeepers were to blame, but if an analysis could be easily obtained the matter might be settled to the satisfaction of both buyer and seller. The adulteration law in this colony had become a dead letter, as it had never been brought into operation.

Archdeacon Austin seconded the motion for the sake of discussion. He said that water had been carefully examined, and it would be a pity if the food question should be left untouched.

Mr. Luke M. Hill said that the Adulteration Act had not been carried out from there being no Government Analyst. The Government Chemist charged \$10 for an analysis to the outside public, but there was a special provision by which a sample of any suspected substance might be delivered to a police or sanitary officer, who would procure an analysis free of any expense. If any person, therefore, wished to have a sample examined, all that he had to do was to take it to one of these officers.

Mr. Coronel thought this formality was too troublesome. A person might like to have an analysis, even when there was no cause for suspicion, so as to satisfy himself.

The Chairman deprecated any troublesome interference with business, which might occur from a Government official going into shops to take away samples. The general principle was that the buyer should look after his own interests.

Archdeacon Austin, with consent of Mr. Coronel, then

proposed that the matter be referred to the Commercial Committee, which was agreed to unanimously.

The thanks of the Society were presented for the following donations:—Mr. Luke M. Hill, 12 vols. Proceedings of the Institute of Civil Engineers; Mr. G. H. Hawtayne, "Some Squeezings from Ancient Monuments in the British Museum."

In presenting the latter donation, Mr. Hawtayne said that he had applied to the British Museum authorities for these Squeezings in anticipation of a lecture on "Books" to be given in a few weeks. They were interesting examples of Egyptian, Assyrian, Phoenician, Hymy-aritic or Sabæan, and Hittite writing and hieroglyphics, and, opportunities of seeing the originals being wanting, they were a very good substitute.

The Chairman introduced Mr. Gieffers, a gentleman who had had some experience in a large starch manufactory in Ecuador, and who wished to establish a similar industry in this colony. On the table were shown a number of samples of different qualities of cassava starch, flake and pearl tapioca, arrowroot, &c. Mr. Hawtayne explained the process of manufacture, which involved improvements in the product and reduction in cost by means of machinery.

The matter was referred to the consideration of the Agricultural Committee.

An enlarged photograph of Dr. Richard Schomburgk was exhibited; it had been procured by the Secretary as a companion portrait to those of Sir Robert Schomburgk now in the Reading Room.

Mr. Quelch exhibited several specimens and explained the structure and general condition of the rattle as met

with commonly in the rattlesnake, and showed that the popular notion that the number of divisions in the rattle corresponded to the age of the snake, was erroneous.

The President in thanking the Curator of the Museum for his information, informed the meeting that the Zoological Society of London had elected Mr. Quelch a Corresponding Member of their Society, and he had no doubt the meeting would be glad to congratulate Mr. Quelch on the honour.

The meeting then terminated.

Notices of Lectures delivered before the Society under the Popular Science Series.

[Detailed Reports of these Lectures, where obtainable, have already appeared in the daily papers.—ED.]

9.—“MUSIC.”

Delivered on Tuesday, January 22nd, by the Rev. Canon Castell.

HE lecturer gave a rapid sketch of the musical element of speech, and of the development of the art and science of music, tracing its necessarily close connection with poetry and poetic expression. The chief methods of musical expression, characteristic of various races, were touched upon, and the special adaptation of music to religious services generally in past and present times was pointed out, special insistence being made of its value as an adjunct to Christian worship. The various forms of musical instruments were then historically treated, and a brief reference made to the immortal names of the great composers, who had placed music on the high pedestal it now occupied.

The lecture was interspersed throughout with selections of classic, operatic, sacred and ballad music, vocal and instrumental, to illustrate special points advanced at various parts of the subject.

10.—“ HIAWATHA : FROM AN ETHNOLOGICAL POINT OF VIEW.”

Delivered on Monday, February 18th, by E. F. im Thurn, M.A., Special Magistrate of the Pomeroon River.

The lecturer dealt with the legendary substance of the poem, pointing out its special interest to the ethnologist, more particularly in relation to the natives of Guiana, who were a primitive folk, not only closely akin to the characters depicted in the poem, but one in much the same stage of civilisation. The historical Hiawatha was then described, and his personality discriminated from the Ojibway hero represented under his name by the poet. The primitive materialism, and its correlated customs among the aboriginal races of the world generally, were touched upon; and the unusually close relation existing between the aboriginal American races, in their modes of life, habits or customs, beliefs, actions, and records, was pointed out, numerous passages being quoted from the poem in illustration of special points of agreement between the North American races and the Aborigines of Guiana, which were compared.

11.—“ METAMORPHOSSES OF MATTER.”

Delivered on Monday, March 18th, by E. E. H. Francis, F.C.S., Government Analytical Chemist.

The lecturer, who, in a former lecture on the same subject, had dealt with chemical changes of matter in relation to *analysis*, now proceeded to describe some of the various chemical changes in relation to inorganic and organic *synthesis*. Reference was made to WOHLER'S conversion of the cyanate of Ammonium into Urea in

1828, and to the artificial production of acetic acid in 1845 by KOLBE and MELSENS, and to the formation of marsh gas by MELSENS in the following year. Marsh gas was shown to be the first of the paraffins, a class of bodies of which endless derivatives are known, and with which the sugars, including sucrose, are intimately connected. The important discovery in organic synthesis, made in 1859 by the famous French chemist BERTHELOT, was referred to, in which the direct union of hydrogen and carbon was caused to form acetylene, which itself was easily converted into benzene, from which a large number of the compounds of the aromatic series of bodies can be obtained. The importance of these syntheses was shown by the fact that nearly all organic compounds can be grouped either as paraffin or benzene derivatives. It was pointed out that the artificial preparation of the albuminous substances had not been accomplished, and that their constitution was but little understood. It was to be expected, however, that their preparation would soon be accomplished, when it was probable that the production of the living principle would also be brought about.

The lecture was illustrated by a large series of experiments.

12.—“ORNAMENT IN ART.”

Delivered on Wednesday, April 24th, by the Revd. Ignatius Scoles, V.G.

The lecturer began by defining the nature of ornament—distinguishing it from colour—and shewing that it is the result of the natural instinct or innate desire of man to find for himself forms of beauty in imitation of

the works of nature. Its early expression under the form of the tattooing and the painting of the body was pointed out ; and its rapid development traced under the ancient Egyptians, the Greeks and Romans, among whom its most typical forms were derived from the conventionalizing of special flowers, leaves, and other objects, such as the lotus, papyrus, acanthus and honeysuckle, etc. The characteristic features of ancient and mediæval art were referred to, with special mention of their peculiar forms, such as the Roman semi-circular arch, the pointed Gothic arch, and the Italian cupola. The principles to which all perfect ornamental art should be subject were then discussed, and its aim at an idealization of nature stated, special reference being made to the congruity which should prevail between ornament and construction.

The lecture was illustrated by a very large series of diagrams, representative of the various styles and forms of art, and their development.

13.—“ FLOWERS : THEIR COLOURS, PERFUMES AND CONTRIVANCES FOR FERTILISATION.

Delivered on Wednesday, May 22nd, by James Rodway, F.L.S., Librarian and Assistant Secretary to the Society.

The lecturer, after giving a short description, of the essential organs of flowers, proceeded to explain some of the reasons why different colours have been developed. Nocturnal flowers are always white, a colour which shows up best on a dark ground of foliage. White flowers, and a few yellows and pinks, are generally scented. The colour and perfume in nocturnal flowers

combine to attract moths and other insects. Brilliant yellows, reds, and blues, are essentially diurnal, and almost universally scentless, because the colour alone is sufficiently attractive. Dull and lurid colours are often associated with heavy disagreeable odours, for the purpose of attracting flies.

The lecturer then proceeded to explain a few of the contrivances by which orchids and other flowers are fertilised, showing some of the insects which carry on the work, and their manner of procedure.

The lecture was illustrated by a few diagrams and a large number of different flowers, many of which were continually referred to for the purpose of explaining the various points in the lecture.

14.—“PHOTOGRAPHY: ITS NATURE, HISTORY AND APPLICATION.

*Delivered on Tuesday, June 25th, by H. H. Cunningham, B.A.,
Stipendiary Magistrate of British Guiana.*

The lecturer began by explaining the essentially simple principle of photographic processes generally; and gave a detailed historical account of the building up of the art and science of photography, with special reference to sensitive plates, and the methods of fixation of the images—the various prominent investigators being named, and the substances made use of described. The special applications of modern photography were then briefly indicated: such as for portrait and pictorial purposes and the reproduction and multiplication of maps, plans, manuscripts, and drawings; for astronomical, microscopical, and geological matters; for the regis-

tion of meteorological phenomena; and for the detection of forgeries.

The lecture was freely illustrated by photographic samples of the various processes, some being shewn by means of an optical lantern belonging to Mr. Luard of Peter's Hall, who also exhibited views of different parts of the world.

ERRATUM.

On page 96, line 25, for *Captain* read *Captor*.

Fruit Growing in the Gulf States of America.

By G. H. Hawtayne, C.M.G., C.M.Z.S., F.R.G.S., President.

 HE Society is indebted to Major WALTHALL for having obtained from the United States Department of Agriculture an interesting report on tropical and semi-tropical fruits.

In this colony the fruit industry has of late, to some extent, occupied attention, and it may be interesting and useful to extract from the above report information as to the fruits grown in the Southern States, and some examples of the energy and enterprise with which fruit growing and the fruit trade are there prosecuted. A perusal of the report is, however, calculated to raise a feeling of self-reproach when the activity of our northern friends in combating climatic difficulties and developing a trade in fruit, carried to other parts of the United States, or as canned and manufactured products, is compared with the apathy with which the produce of our fruit trees is regarded by us, and the feebleness of our attempts to cultivate, much less improve, or to convert into a valuable export, the fruit that grows or can be grown in this colony.

The States bordering the Gulf of Mexico, and thence called the Gulf States, comprise Florida, Alabama, Mississippi, Louisiana, and Texas, and are the regions in which tropical fruits are cultivated. They lie between 25 and 35 degrees north latitude, but only the peninsular part of Florida and a corner of Texas are

south of 29 degrees. The ordinary temperature varies from 40° to 86°. In the more northern parts it sometimes falls to 27° and even lower.

The principal fruits raised in the most Southern States of America are pines, mangos, bananas, oranges, guavas, and figs.

Pine apple cultivation was begun in Florida in 1860, when slips were imported from Havana and planted on one of the numerous keys or islets off the coast of Florida. The experiment was so successful that the industry grew rapidly, and the acreage planted in pines is now very extensive. Even a slight frost is, however, detrimental to this plant, and in some localities the pines are protected by sheds of palm leaves. In 1886 the crops on the mainland were destroyed by cold, and those on the keys suffered in quantity and quality. An outbreak of yellow fever in the same year at Key West, which lies off the southern point of Florida, and is one of the chief depôts of the shipping trade, interrupted business for some weeks at a critical time, and tons of rotten fruit had to be destroyed by the sanitary authorities.

It appears that growers as a rule are satisfied with selling their pines at five cents each. But different kinds bring different prices, and while "Red Spanish" fetch 25 to 50 cents per dozen, "Sugar-loaves" command \$1.20, and "Porto Ricos" are worth 50 cents each.

The red Spanish pine above referred to is described as a short fruit, bulging in the middle and ruddy yellow when ripe. The Sugar-loaf is pyramidal in shape, and pale green, changing to a fine yellow, with an exquisite flavour. The Porto Rico attains a weight of 6 to 15 lbs. and has a delicious taste.

On these keys the pine flourishes in a very thin stratum of leaf mould lying on coralline rock, and requiring no previous digging or cultivation. It would seem that the hard ground prevents the use of any implement, and so the slips are stuck into any convenient cranny, or else planted in a little scraped-together soil, where weeding can only be done by hand.

I may here record a West Indian superstition that the time that will elapse before a pine plant will bear, depends on the number of chops or blows given with the hoe when planting it. If a sufficiently deep hole is made with one chop the pine will bear in one year, if two chops are required the fruit will take two years, and so on.

The crop of the Florida keys, with the exception of small quantities carried to the coast, is sold in New York. Want of rapid communication prevents the conveyance of this fruit to the ports on the Atlantic and Gulf.

The pine is reported to be a "good shipper" for a tropical fruit, standing rough handling, and, if not cut too late, keeping for three weeks.

The report gives a list of no fewer than 63 varieties of the pine. The names of some of which indicate a West Indian origin, such as Antigua Queen, Black Jamaica, Montserrat, Cayenne, Striped Surinam, St. Vincent, Trinidad Pitch-lake, &c.

I am not aware how many different sorts of pine are raised in Guiana. As a rule one only sees two yellow kinds, often brought to market in a bruised condition, and a fine flavoured variety, with red skin and white flesh, resembling in taste that of a peach.

A beautiful fibre can be obtained from the leaves of the pine apple, but they require to be steeped in water eighteen days, and the difficulty of extraction prevents its being largely used.

There are in the colony regions, where suitable soil exists for the cultivation of this really hardy fruit-plant—and, having regard to its keeping qualities, it would seem that, freights being favourable, it might be profitably sent to markets not more than twenty-one days distant.

The mango comes in for a full share of notice. The fruit is greatly appreciated, but the statement that the seeds are roasted and eaten in tropical countries will be new at all events, to the dwellers in Guiana. We do not, however, seem to utilize this fruit as much as we ought. In India the sliced fruit is a common ingredient in curry and forms an excellent pickle, of which Bombay stuffed mangos are an example. Here we prefer importing English pickles to using the materials we have at hand. As a food tree it is loudly praised in the report, since horses and cattle in Florida eat the fruit readily and thrive upon it. The mango was, after some attempts, which failed, successfully introduced in Florida so recently as 1877, and when eight years old the mangoes on the two parent trees were estimated to be as many as 19,000, some of them one pound in weight. Eleven trees in the fourth year from planting yielded fruit which sold for \$219, and two years afterwards, bushels of their crop were shipped, realising at Chicago 60 cents per dozen. These results are startling, especially when one reads that the variety most commonly grown is the "turpentine mango, one of the most inferior sorts, but better than no mango at all."

The report states that the fruit can be canned, preserved, and used in any way in which the apple and pear are prepared. The wood is said to be used in tropical climates for waggon building, for which its toughness recommends it. I am not aware of the timber of the mango being thus utilized in the West Indies or in Guiana.

Sixty-one varieties are mentioned as growing in Florida, many of them introduced from Cuba. The famous No. 11 from Jamaica has been introduced, but is not yet fruiting. Single specimens in that island are said to weigh 4 lbs. each.

No tropical fruit is cultivated over a larger extent in the Gulf States than is the banana, which has been found to be of easy culture, and so far hardy that it sends out strong suckers soon after it has been killed to the ground by frost. A healthy banana plant will stand a temperature as low as 25 degs. Fahrenheit for a few hours without much injury. One has seen in some of the public gardens at home, such as Battersea Park, one of those exiles grown as a foliage plant, struggling against the fog and cold of a London October day, and looking very miserable under the circumstances.

The banana is grown from Southern Texas to Saint Cardine often as a merely ornamental plant. In some parts of Florida its culture is profitable, since it sells in most cases for as much as 5 cents a finger, a larger price than is obtained in New York. At Orlando and in Orange County they fetch wholesale 1½ and 2 cents a finger, and retail at 2½ cents each. At Manatu the price for the last six years has been one cent each.

It will be seen that these prices would leave the

American banana importer a considerable margin over the cost of the fruit as purchased in Guiana.

Cuba supplies a large quantity of this fruit, as well as of the plantain, of which it is the sole exporter, sending tons to Key West, from which it is distant about 90 miles.

There are many varieties of bananas and plantains mentioned in the report. *Musa paradisiaca*, variety *Sapientum*, the most common banana, to eat which in perfection, we are told it must be allowed to ripen on the stalk—the Red Jamaica or Red Spanish, the stalks and leaf ribs of which are wine colour, and the fruit the red or purple banana shipped from the West Indies to the northern ports. Its beauty recommends it as a foliage plant. Hart's Choice, Lady Finger, &c., *Musa orientum*, is reported to be the best and most profitable banana cultivated in Florida. It is said to have come from Abyssinia, but has long been grown in the West Indies. Its fruit sells in the Florida markets for double the price obtained for the Orinoco variety.

It would be useless to mention each of the thirty-eight varieties which find place in the report. Among them are the *Musa dacca* from China, *Musa ensete* (non-edible) from Abyssinia, *Musa Suniarum* or *Acuminata*, from Malacca and the Sunda Islands, where the fruit sometimes attains a length of two feet. *Musa troglodytorum*, indigenous to India and the Pacific Islands, the fruit of which stands upright, the list showing the various sources from which the Florida banana growers have drawn their supplies.

Mr. JENMAN informs me, however, that in our Botanic Gardens there are, including plantains, probably from

18 to 24 varieties. They are not all named, and of those that are, the names are unfamiliar. Amongst them are the Giant, Green, Red, Fig, Sherlocks, Common Chinese, Martinique, which variety is grown in Jamaica for the fruit trade, and the Manilla, from which the well known fibre is obtained. No mention is made in the report of any use being made of the plantain or banana fibre derived from the stalks. My readers will not have forgotten the interesting specimen of paper stuff made from the edible banana by Mr. CROSS, who reported on the West Indian fibres at the Colonial and Indian Exhibition and sent to the Society by me in 1886.

The orange is probably the most important fruit of the more southern parts of America. In Louisiana and Florida more fruit has been raised than suffices for home consumption. Orange growing in Florida has been attractive to numbers, including many young Englishmen, who have gone out with hopes of unchequered success. The report from which these extracts are made speaks of the greed and fraud of land agents, and of reckless extravagance and speculation being common among growers in that State until the "great freeze" of January, 1886, which proved the severest shock to the orange industry ever known in the Gulf States. Orange culture, we are told, is no longer an easy and agreeable way of making an immense fortune, nor is Florida a modern El Dorado.

But like most reverses, the "great freeze" has taught useful lessons, and amongst them that orange culture is but on a level with any honest agricultural pursuit. A successful orange grower, like a successful cane planter, must be devoted to his work and everything appertain-

ing to it, and provided with brains, patience, and energy. The shortened crop raised hopes of high prices, but disappointment arose from defects in the system of marketing—the crowding of the large markets to the exclusion of the smaller—high rates of railroad and other freight, and lastly and chiefly, the shipment of immense quantities of inferior fruit. If ever Guiana becomes a fruit exporting country this lesson may be useful to us. Products are often denied fair play with disheartening results. Careless selection, unsuitable packages,* “rushing” a market at unseasonable times, are all errors into which inexperienced, eager exporters too often fall.

Some figures are given showing the profits derived from a plantation or grove of 4,000 trees, of which only 1,500 are bearing; of these 1,500 700 have been planted sixteen years, 400 eleven years, and 400 seven to ten years. From them there were shipped, in 1886-7, 4,724 boxes, sold, freight deducted, for \$7,168.96 or \$1.50 per box, which, after deducting entire expenses of the whole grove, including overseer's salary, taxes,, &c., left a balance of \$3,463 net proceeds for the year.

From 200 trees, five years old, 80,000 oranges were picked two years previously.

Frost is not the only enemy of the orange tree. Its insect foes are said to number over fifty (the most dangerous being the scale insect) and are described by W.M. H. ASHMEAD and Dr. KENNEDY, whose works are published in Jacksonville, as well as in the reports of Professors RILEY and COMSTOCK, published by the United

* See letters on the Packing of Fruit for Shipment reprinted from *Timehri*.

States Department of Agriculture, June, 1878. Several works on orange culture exist, while much valuable information is to be found in the agricultural newspapers of Florida. 142 varieties of the orange proper (*Citrus aurantium dulcis*) are named in the report as being cultivated in Florida. Some being imported from Japan, Havana, Cochin China, Mediterranean, Sandwich Islands, Himalaya, Majorca, Malta, Brazil, and other sources. In California the leading varieties are Mediterranean Sweet, Maltese Blood, Paper Rind, St. Michael, and Valentine Late; Mandarin and Tangerine are also profitable.

Some of the largest yields in California are from small holdings, the owners of which have attended to details themselves, and have been watchful in regard to injurious insects.

The stocks on which, in Florida, the orange is grafted, or rather budded, are seedling sweet and sour oranges, the Florida or rough lemon, and the Pommelo or Grape fruit. The best growers advocate training the trees into a low bushy head. In such cases the trunk is healthier, the fruit more easily gathered, and less liable to be blown off during high winds.

Besides growing the fruit for export, the orange wine industry is being largely developed, and of still more importance is the perfumery industry, the fallen blossoms being collected for the purpose.

Reference may here be made to the remarks made by Dr. PAUL* respecting the raw materials to be found in the West Indies, which are useful in the manufacture of perfumes, and to the suggestion of Mr. FIELD,† that

* Colonial and Indian Exhibition Reports, page 259.

† *Timehri*, Vol. 1, N. S., page 21.

citron and orange oils which are supplied to English markets by Messina and Spain might and ought to be obtained from our own Colonies.

Orange trees which have succeeded in California are being introduced into South Australia, and among those selected as the best in existence of their several kinds, are the Washington Navel, Mediterranean Sweet, and Ruby. Some 200 acres are being planted by one enterprising proprietor. There will no doubt be a market in England for South Australian oranges, as for other fruits which vessels fitted with refrigerators are enabled to bring to the London market in excellent condition.

The cultivation of the Shaddock (of which there are said to be forty varieties, the fruit of some occasionally weighing 15 lbs.) and of Pommeloes or Grape fruit is being extended. The last named is considered a first class marketable fruit, selling in the Northern States, when the main orange season is over, from $7\frac{1}{2}$ to 15 cents each.

The citron (*Citrus medica cedra*), from the thick rind of which candied citron of commerce is prepared, is for some reason rarely grown in Florida. It is the most tender of all the citrus tribe.

The lemon (*Citrus medica limonum*) appears to be largely grown and a great many varieties are mentioned. Some, however, are of inferior quality, and the exportation of these has in many cases damaged the reputation of the Florida lemon. Lemons, at all events those of a good kind, do not grow here, but the following directions for curing lemons might be tried with our limes. They are furnished by a firm of growers who realize from \$1.50 to \$9.20 a box for their lemons:—The lemons are cut when two inches diameter, then piled in a heap on

the floor in a dark, close room, and covered with a blanket or cloth. They remain forty-eight hours; at the end of which time they will be in a profuse sweat. They should be wiped dry and put on shelves in single layers in a dark room and kept seven to ten days until coloured a pale straw colour, when they are wrapped, sized, and packed.

Another plan is to pick green, dry for one hour, wrap them in two sheets of common wrapping paper and pack in an air-tight box in a closed room. They will be finely coloured in six weeks to two months and will keep for many months.

The report speaks of limes as being preferable to lemons, but they are not much appreciated in the northern markets. Fifteen varieties are named: among which appear the Persian, Tahiti, and seven from the Himalayan region. The manufacture of citric acid and preparation of lime juice do not exist.

The guava (*Psidium*) is perhaps, from its being so common in this colony, rather despised, except for jelly making. There are, according to Mr. JENMAN, to whom I am indebted for this and other information, about six cultivated varieties in the Botanic Gardens, all belonging to one out of the many species of *Psidium*.

The frost of 1886 having killed nearly all the trees in the State of Florida, except those of the Cattley and Chinese kinds, the guava, which is styled the apple of Florida, has been much prized since that date.

Although tropical and sub-tropical America are considered to be the home of the guava, the Cattley guava was introduced in 1820 into England, where it was grown in hot houses, from China, where it is probable it was first carried from Brazil. The common guava (*Psidium guajava*) which was first introduced into

South Florida in 1847 from Havana, is extensively grown, and a jelly factory exists at Fort Gatlin, where fifty cents a bushel is paid for the fruit. At Adam Quays and Jacksonville they fetch \$1.50 and \$2.00 a bushel. There are ten varieties at present cultivated in Florida—one of which, the white winter guava, described as very large, 3 or 4 inches in length, pear shaped, with few seeds, is unsurpassed for canning, as the seeds can be removed like the core of an apple. The Guinea guava produces fruit an inch in diameter of exquisite flavour. *Psidium araca* from Brazil is well spoken of. The Cattley guava (*Psidium Cattleyanum*) bears fruit an inch in diameter of a fine dark colour and with a strawberry flavour.

The report contains a list of a dozen other guavas natives of Central and South America.

The report insists on the value of the fig (*Ficus Carica*) and remarks that no attempt has been made in Florida to dry or prepare the fig for commercial purposes.

The fig grows well in this colony and some remarks as to its culture and preparation may be of interest. The price in New York for figs grown in the Gulf States is about 35 cents a quart. A large number of figs are named, amongst them the White Adriatic, from which the finest Smyrna figs of commerce are produced, and it begins to bear the year after it is planted. In California there are trees yielding from 1,800 to 2,000 lbs. of green fruit. In that State the common variety is the Mission which was introduced from Mexico.

Dried figs are prepared at Los Angelos by being placed when cut, on trays having laths on the bottom, on which the eye of the fig is placed so as to

arrest leakage of the sugary contents. The figs are dried in the sun, being turned every day. At night they are covered over, and if as dry in the morning as in the evening, they are sufficiently dried. They are then dipped for a second in a boiling solution of rock salt, and they are then pressed with finger and thumb so as to distribute the thick skin round the eye and the fine skin at the stalk end, which is uppermost when packed, the appearance being improved thereby. The figs are then packed in boxes. The white flowery substance on old Smyrna figs consists of grape sugar and small crystals of rock salt.

Another process is treatment with sulphur and sun drying.

It may be of interest to transfer from the pages of the report notices of fruit with which we are familiar, and which appear to attract much attention in Florida and other Southern States.

The Sapodilla (*Achras sapota*) is one of the principal fruit trees grown on Key West, where it has been cultivated for many years. To stand shipment it must be picked green, when it loses the delicious flavour acquired by being ripened on the tree. To carry the ripe fruit successfully, refrigerators are necessary. Some of the fruit weighs over a pound. They appear to require careful precautions against frost. Being propagated from seed there arises a great difference in size, shape, and flavour of the fruit.

The Sapodilla has been introduced into India, where, according to Dr. WATT, the fruit is not much appreciated but is surreptitiously sold in the streets as Mangosteen.*

* Catalogue of Exhibits by Government of India at Colonial and Indian Exhibition, 1886. page 77.

The report makes mention of the Mamme Sapota (*Lucuma mammosa*), the cultivation of which has been but lately introduced, and the trees in South Florida and the keys do not appear to have commenced to bear. The fruit obtained from Cuba sells at 40 cents a dozen.

The star apple (*Chrysophyllum Cainito*) has, as yet, been planted in Florida in only small numbers and quite recently. There is a good demand for the fruit at Key West, where they fetch 15 to 30 cents a dozen.

The sugar apple or sweet sop (*Anona squamosa*) appears to be largely grown, and the writer of the report is loud in his praises of its virtues. This fruit is said to have greatly improved under cultivation in India. The Cherumoya is grown to the same extent.

The Sour Sop (*Anona muricata*) is cultivated in South Florida to a small extent, although the Cuban fruit sells readily at 10 to 20 cents each.

The Cashew nut (*Anacardium*) is also mentioned, but has received but little notice. The kernel is said to be made into puddings, roasted, and in other ways prepared for the table. One use, probably novel to us in Guiana, is to improve the flavour of old Madeira wine,—and although the acrid nature of the oil contained in the coating of the kernel is familiar to us, it is not, I think, generally known that the vapour of the nuts when roasted, causes erysipelas. It may also be a fact new to us that a pleasant vinous liquor is evolved from the fleshy stalk of the Cashew fruit by fermentation, and that by distillation, a pleasantly flavoured spirit is obtained.

Other fruits are noticed, such as the cocoa plum (*Chrysobalanus Icaco*), which is popularly known under the suggestive, but unpoetical, name of Fat-pork here,

and grows wild and in gardens, as Mr. JENMAN informs me; Rose apple or Pomme rose (*Eugenia jambosa*), Barbados gooseberry (*Pereskia aculeata*), strawberry tree, the arbutus of Europe, and Pistachio (*Pistacia vera*) which have been introduced into Florida, but their cultivation does not appear as yet to have been very general or very successful.

The sea grape (*Coccoloba uvifera*), known to us as a temptation to small boys to throw stones, appears to be much appreciated along the Florida coast, where the fruit is eaten raw, or in preserves and jellies.

Of the pawpaw (*Carica papaya*) there are several varieties: one is spoken of as bearing small bitter fruit the size of an egg or smaller, while another bears fruit of 5 and 10 lbs. weight. The fruit will not stand 24 hours transportation when ripe. Its property of rendering raw meat tender, and its use as a fruit to be eaten raw, or stewed with sugar, are known in Florida.

It will be remembered that this peculiar property of the pawpaw has been utilised in the treatment of dyspepsia, and papaine is superseding pepsine, prepared from the gastric juice of swine by a clever, but not very attractive process. Papaine is also used in diphtheria with the view of dissolving the membrane, which is one of the characteristics of that disease.

The Otaheite gooseberry (*Cicca disticha*), although susceptible of cold, is largely cultivated as an ornamental tree and for its fruit, which is highly esteemed for pastry, jellies, and preserves. These good qualities do not seem to be recognised by us in British Guiana to any great extent.

The cultivation of the cocoa nut palm is one of the leading industries of South Florida, although its tender-

ness as regards frost prevents its being grown north of Charlotte Harbour in that state. The palms are free from disease, nor are they attacked by rats as in Jamaica, where we learn the trees are protected by zinc sheets nailed on to them, over which the vermin cannot climb.

The Mamme apple or St. Domingo apricot (*Mammea americana*) is spoken of as a delicious fruit—popular in Key West, which is supplied from Cuba, and capable of standing a week or more of transportation. This tree is a native of Carribbee Islands.

The Ginep (*Melicocca bijuga*), which is not much prized in the West Indies, is said to market well.

To the fruit of the several varieties of passion flower the name Granadilla is indiscriminately applied. That known in Florida as *Passiflora edulis* bears fruit as large as a goose egg of a purple colour. The Granda-dilla (*Passiflora quadrangularis*) is grown to a small extent in Florida.

The Semitoos and Bell Apples (*Passiflora laurifolia*) which reached London in 1886 in excellent condition were much appreciated. They are easily grown and keep well.

The Avocado pear (*Persea gratissima*) has been known for many years in Florida, where it is said to bear the fifth year from seed, and to yield as many as 500 fruit each tree when in full productiveness. The fruit sells from 72 cents to \$1 per dozen.

The healthiest trees are planted on high rich shell mounds—a high rich location with yellow subsoil also suits them. In this colony, where the trees fail suddenly from, as is supposed, the roots striking an uncongenial stratum, a prepared soil resembling the above might be tried with success.

It is stated that the fruit ships well, and is every year imported from the West Indies—which island is not mentioned—to New York, where they retail at from 20 to 40 cents each, and where the sales average from 300 to 500 fruits per week during the season, June to November.

We here know the Avocado pear as a tender fruit—spoiling if picked full, in a very short while. I have seen them in the London shops, each carefully laid in a separate compartment of a box—and understood they came from the Azores. If they command such a large price in New York, and the means of carrying them safely thither can be compassed, it would surely be worth the while of our farmers here to raise this fruit.

It is to be regretted that our climate is too warm for the tree tomato of Jamaica (*Solanum betaceum*)—the plants of which raised by MR. JENMAN all died in two years, as from its description it would be a welcome addition to the fruit of British Guiana.

The Hogplum (*Spondias lutea*), from which a jelly, pleasing in appearance as well as in taste, is made—the Tamarind and the Almond (*Terminalia catappa*) are also favourably mentioned in the report. The last named has been described by CHARLES KINGSLEY, who says it is not an almond at all, but named as so many West Indian plants have been, after some known plant, to which it bore a likeness, and introduced from the East Indies through Arabia and tropical Africa, having begun its westward journey probably in the pocket of some follower of VASCO DE GAMA.

A long list is given of tropical fruits recently introduced into Florida, probably not yet fruiting, and but little known.

Among them are several quite familiar to us, and others which are not common, if indeed known here. The *Antidesma Bunias* from Java, with bright red fruit changing into black, used for preserving ; the *Deltonia luctea* of Brazil, where it is called the *Capuassu*, bearing fruit, one of which, we are told, when ripe, will deliciously perfume the air. The pulp washed off in water and strained, with sugar added, obtains the title of "Wine of Capuassu," to drink which is said to be worth a voyage across the Atlantic. The *Lucuma Caimito* is a handsome ornamental tree, and its fruit one of the best in Brazil. The Chilian myrtle, the *Leechee Nephelium Litchi* of China, said to be as delicious as any fruit in existence. *Platonia insignis*, from the fruit of which the choicest and most expensive preserve in Brazil is made, are among the new arrivals, while the pamphlet is embellished with coloured representations of some Japanese plums, which, if they are as toothsome as they are beautiful to the eye, must be delicious food.

The above extracts will, it is hoped, be interesting to our agricultural friends. They will serve to shew that fruit growing, even under difficulties from which we are happily free, can be made profitable. What is required is quick transport to market. This, it may be, is beyond the power of our small farmers to obtain without aid from the Government, but it must not be forgotten that state aid will not supply what are indispensable, but in a large degree lamentably absent among our small-industry people, viz.—Energy and Patience.

*“Letters of Aristodemus and Sincerus.”**

AN OLD BOOK ON THE COLONIES OF DEMERARA AND ESSEQUEBO.

By *James Rodway, F.L.S.*

 HIS work appears to have been quite unknown to the English writers on these colonies, and as it is very interesting and valuable for the light it throws on the state of affairs at a rather critical period in our history, a brief account of the book will probably be interesting at the present time. Who were the writers of the letters is unknown, and from the style of the work it may be presumed they had good reasons for remaining in the background. The correspondence was originally published in the *Courier van Europa*, the principal writer, who styles himself Aristodemus, dating from Demerara, September 2nd, 1784, while the reply of Sincerus purports to have been sent from that colony on the 26th of the same month. This seems to show that the parties were living in the Netherlands, being probably Demerara proprietors or persons interested in the two rivers.

As may be seen from the contents of the twelve volumes, the “Letters” form less than half the work, the remainder being made up of prefaces and observations of the editor, and appendices, the latter being the most important, as they contain copies of official papers connected with the colonies. Aristodemus writes very

* Brieven over het Bestuur der Colonien Essequebo en Demerary, gewisseld tusschen de Heeren Aristodemus en Sincerus, nevens Bylagen, &c. Amsterdam, 1785-8, 12 vols., 8vo.

forcibly, and speaks of the tyranny and meanness of the Company in such plain language, that it can easily be understood why he hid himself under a *nom de plume*. It has been suggested to me as probable, that a certain well-known gentleman, interested in Demerara, named DIRK HOOLA VAN NOOTEN, had something to do with the matter, which is quite possible. If such was the case, the well-known Georgetown family of that name have reason to be proud of their ancestor.

Coming to the appendices, which, as was said before, form the most important division of the work, they are simply invaluable to the historical student. Here we find all the evidence that could be procured on several important matters, including the precedents for Colonial Representation in the Council, terms of land grants, prices of produce and the taxes paid thereon, prices of slaves and the cost of procuring them, a suggested plan for erecting Government buildings in the new town (Stabroek), a project for a civil list, and a number of other interesting subjects. The petitions however are, perhaps, above all the other documents, of the greatest importance. The planters and inhabitants spoke plainly, told the Company that they had better give up the colonies to the state, informed the States General that there was no government in Essequebo and Demerara, told the Directeur-General that his council was only a pretended one, and altogether made Mr. JAN L'ESPINASSE and the Council of Ten feel very uncomfortable. To the petitions are attached copies of the signatures, so that a fair idea can be formed of the principal planters living at the time, and these will be found especially interesting in elucidating family history. To give an idea of the scope

of the work, the following sketch of the troubles which led to such a voluminous book are taken from the different volumes and freely translated : —

In 1785, the colonies had been just given over by the French, who had held them on behalf of the Dutch for about three years. No town existed in Demerara up to the present, but during the French occupation a little village had grown up in the neighbourhood of the Brandwagt, which they called *la nouvelle ville* or *Long-champs*. The fort on the east bank of the Demerara River (now Fort William Frederick) was also built at this time, and named *Le Dauphin*, while another on the opposite side was called *La Reine*.

Complaints had been continually made by the planters of the want of protection for their estates, to which the West India Company gave little heed, throwing in their teeth the fact that when the first lands were granted in Demerara it was stipulated that the Company should not be bound to erect fortifications. The want of a proper seat of government had also been felt for some time before the capture of the colonies, the Commandeur trying to get it placed near his own plantation, only thinking of the convenience to himself.

In anticipation of the colony being given up by the French, meetings were held at the Hague in 1783, to formulate a plan for the regulation of the government of the colonies. It was understood that the Company were financially unable to do much, and therefore the assistance of the Stadtholder and States General would be necessary. The Province of Holland would do nothing unless the navigation and trade of the colonies were entirely free to all citizens of the Netherlands. Four

points were considered: first, political government; second, administration of justice; third, defence; and last, estimate of expenses and how they were to be raised. On consideration of these matters it was decided to recommend that the two colonies should be placed under one head, a Directeur-General, who should reside in Demerara. The island of Borssele being too small, it was recommended that the seat of government should be on Pln. Jonge Rachel, at the mouth of the Hobaboe Creek. The political government should be placed under the Council of Policy, to consist of the Directeur-General, and four of the servants of the Company, who should receive proper salaries and be independent of other employment. Essequebo was to have a similar Council under a Commandeur, and Combined Councils of Policy were to be held at intervals in Demerara. A proper person should be placed at the head of the Court of Justice, which should consist of six citizens chosen by the Burgher Court Martial. Demerara should be put in proper state of defence, and the Brandwagt and some other posts be properly manned and armed; Essequebo should also be put in proper order and a post established at the Orinoco in a position to make such a defence as might be necessary; for all of which 250 soldiers were considered sufficient. A plan of the buildings required for the new town, as well a complete civil list, were prepared, and estimated to cost $f1,000,000$ to put in working order, and a further sum of $f250,000$ annually to keep them up. The taxes would have to be raised to support this new system, and, on further information, other matters would be decided. Mr. M. B. HARTSINCK, a planter of Demerara, being then in the

Netherlands, was chosen to proceed to the colony, with Mr. C. C. CANNE, an engineer, provided with authorizations and instructions to initiate the new work and settle the site of the new town.

On their arrival they found the nucleus of a town existing, and after some hesitation it was chosen as the seat of government and named Stabroek. A Directeur-General, JAN. L'ESPINASSE, and other officials came out in March, 1785, and took over the Government from JOSEPH BOURDA and his three associate councillors, who had remained in office during the English and French occupation, and chose other councillors. JOSEPH BOURDA and his associates having been chosen for life as representative councillors, the planters did not like this state of things, but when the taxes were raised they openly murmured and petitioned against it. "If any colony (said they) had a right to demand freedom of taxes, if only for one year, it is this, when it is taken into account the great losses suffered by war and its results. It commenced with the loss of thirty-two ships at sea and in the rivers, of which many were full and others partly laden with the produce of the colony; this was followed by great scarcity of the necessaries of life; during many months we were without ships to load produce, so that the sugar ran away to molasses, and much coffee was spoilt by weevils. When at the latter part of 1781 some English vessels arrived and took in their loads, then came the French squadron to disappoint our expectations, taking the colony from our enemy, and by right of war the produce in the British vessels became again confiscated, so that the planters and inhabitants suffered a new loss. In the last month of the English

rule supplies of provisions came in, but this new change of affairs raised the prices of everything to the highest point, and this lasted until the necessary supplies could be procured from the islands first and afterwards from Europe in neutral vessels.

"The re-taking of the colonies by the French caused great suffering, from which we had been free under the English; the English Governor came alone, and, having no soldiers, did not think of building a fort, but the French being in a different position, their first care was to fortify the colony, for which the planters were obliged to furnish slaves, so that during 1782 and 1783, thirty thousand days of slave labour were supplied by them. To these hardships must be added a double head-tax in 1782-3, and a great loss to the planters from their produce being transported under neutral flags, by which the net returns of sugar were reduced to almost nothing, and cotton and coffee to half their value.

"The planters and inhabitants dare flatter themselves that their High Mightinesses will take all these things into their favourable consideration, and treat their far-away subjects equally with those at home when storms and inundations have occurred in some of the provinces, by permitting the remission of all head-money for one year, the granting of which they hereby implore from their High Mightinesses."

It appears that the planters were very pleased when they heard of the deliberations at the Hague in 1783, but grievously disappointed on hearing the results, which alas, instead of improving, had put matters on a worse footing. The Council of Ten, instead of carrying out the recommendations of the Hague Committee, had

(from want of funds) reduced the estimated cost of almost everything. As an example, the Fiscal was to have a salary of £1,000, but the Council of Ten only allowed £450. "Nobody of importance would accept such a low salary, as the meanest white received £300 to £400, together with a free house, food, and washing. To show the cheese-paring policy of the Ten; the yearly expenditure was estimated at fully £250,000, which a later concept-plan reduced to £187,550; but the members of the last meeting of the Ten had found ways and means to reduce the whole annual expenditure to £16,800.

By the new regulations no produce was to be shipped without previous notification to the secretary of the quality and quantity, on pain of forfeiture to the Company. The reason for this law was supposed to be that nothing should be sent away from mortgaged estates, except to the persons entitled. This was considered as very oppressive to the estates which were unincumbered, and especially to those at a distance, such as at Mahaica.

Another law which gave great offence was, that one white man was to be employed to every fifty slaves. This law they said was useless, as it would be better to increase the garrison, which could be maintained at a lower figure. The planters were given two years to comply, but it was considered doubtful if they would ever succeed in getting such a number of whites as would be required. Even if the law was carried out, nothing could be more dangerous to the peace, as each white man from his higher rank became very assuming, and was unwilling to be under subordination, so that when several white servants were employed together each wanted to be master, and daily quarrels took place,

ending in disturbances. If the worst were sent away there was no certainty of obtaining better ones, and taking everything into consideration, the law was considered useless, unworkable, and mischievous.

What would be thought of such a law as this now-a-days? "The Fiscal is authorised to prevent any public meetings being held tending to be derogatory or disrespectful to the Government, either at Fort Zeelandi, in the town of Stabroek, or in the rivers or creeks; the offenders to be whipped."

The increase of taxes by the Company gave rise to a great deal of controversy, the planters claiming that they were entitled to have their say in the matter. According to the Charter of the Company it appears that it was entitled to claim a tenth part of the produce after the first five years, and the Directors asked them how they would like such an impost. Again, it was claimed by the people that no new taxes could be imposed until both rivers were put into a proper state of defence, to which the Company replied that the grants in Demerara were given out on condition that it should not be bound to furnish fortifications.

The planters collected all the evidence they could find as to the regulations of the Company, as well as precedents and usage; first, to prove that they were entitled to representation in the Council; and, second, as to their liability to pay taxes when not imposed with consent of the Colonial Councillors. The Company appears to have had the best of the argument, as their ruling was absolute, not admitting of dispute. The Council of Ten could make an order to-day and revoke it to-morrow, if they chose, but it is not to be supposed that they

wished to impose on the colonists, but money must be had somehow, and if they obtained a loan from the States General for the purpose of providing forts and posts, the expense of keeping these armed and manned would require extra taxes. Whether the planters were unable to see this side of the question, or purposelv ignored it, it is hard to say ; as a matter of fact they stuck to their complaints through thick and thin, while the Company would not give way in the least.

The writers of these letters seem certainly to have been well read, as they go over the whole field of colonial history, quoting from some of the principal writers of the day, English, French, and Dutch, and continually referring to the new republic of the United States. The planters are said to have had the feelings of republicans : they did not however refuse obedience to a constitution, but only wished to defend the rights they had held since 1773, and which had been given them by the supreme government of the Netherlands. On the maintenance of these the prosperity of the colonies depended, but the Company had adopted such a deplorable system that the constitution had been turned upside down. Writing in 1788 they say that for three years the colonies have been without a government, and it was the duty of every free-born subje&t to protest against this state of things. Petitions and memorials were continually sent to the Council of Ten, who replied to one of them, that the republic never could admit a democratic or popular government.

One of the appendices is entitled "My Ideas on the Colonies of Demerara and Essequebo ;" from which it may be gathered that the planters were very much dis-

satisfied with the West India Company. The following is a *résumé* of the "Ideas":—

The profits of the Company are mostly realised from the navigation and trade of the colonies. Fortifications ought to be established so that an enemy might be kept out, and a fleet kept constantly cruising off the coast, the expenses of which should be defrayed by the nation generally. The colonies should belong to the nation, not to a company, and taxation be light and also regulated by the Government of the Netherlands. If this is done the profits will be great, and instead of being confined to a few persons, will benefit the whole nation and develop navigation; on this account the states should undertake to pay the costs of the defence. The nation should offer premiums for agricultural improvements, breeding of horses and cattle, &c. The prosperity of the colonies has increased wonderfully during the last ten or twelve years. The first planters were poor, but hardly any of them were encumbered with debt. Estates in the upper part of the rivers turned out very barren, but it was soon found that there was plenty of rich land at the mouths of the rivers and along the coast. Concessions were very large at first, but afterwards the estates became split up into smaller lots. Credit was for a long time quite unknown, when it came it poured in too fast—it came too early, fell in bad hands, and occasioned more harm than good. If this influx of money had come later, it would not have been squandered uselessly on the upper river estates, but would have been used to advantage on the rich low lands. On the higher grounds we only get from one to three good crops of sugar, while even coffee, although it looks well and appears

promising, will not give good crops after five or six years. With all the losses on the upper lands, however, the colonies did not go back, but, on the contrary, they improved, even in spite of the fact that money could not be had at any price on account of the severe losses. Slaves are sold much higher here than in Berbice, Surinam, or St. Eustatius, while our produce fetches a very low price. The nation should open up the slave trade direct with Africa and establish trading stations on the coast in the same manner that the English are doing; in this way we should not only get cheap slaves, but also find a market for our plantation rum. Neither justice or equity are known in these colonies, there are no legal gentlemen, but plenty of law, planters' law, Roman law and Dutch law, administered by people, some of whom are unable to read the language, and those who can do so still utterly incompetent to understand the laws.

According to a letter from an attorney to his principal, the administration of justice was wretched, few of the colonists were fit to sit on the bench; most of them Germans, English, and French, knowing nothing of the Dutch law. The colonies required first-class men, not only as lawyers, but also as merchants and navigators.

A similar letter gives a very clear statement of affairs as follows:—

“ If no new settlers, no buyers, no slaves, and no proper servants are introduced; if no proper regulations are made, and if we get only the same old government and servants of the same kind as are usually sent out here, then I would advise you to end the matter and abandon the place. To the West India Company the colony has always been a source of trouble and loss; it

never flourished and never paid the Company after deducting the cost of defence and maintenance. In time of need the Company would not support the colonies, nor make advances when necessary, notwithstanding those advances could have been paid back threefold within two or three years. The Company possessed too many interests, and therefore could not concentrate its attention here, and besides this it was under the control of several chambers, and every chamber had its discordant members. It followed, therefore, that the resolutions and orders took long periods before they became settled, during which the colonies stood in need of strict orders and immediate action. The heads of the Company knew nothing of the state of affairs in the colonies and even forgot their own resolutions. Should they ever publish all the orders and resolutions of the Company, the nation, yes, and even the Directors themselves, would be dumbfounded, astonished, and ashamed at their contents.

“ I have done my duty, I have told everything, I am resigned, my conscience is clear, I have tried to prevent myself and friends in the colony from being ruined. I say it again, I write it here, and dare loudly to proclaim it, yes, have it printed in leaded type, that it will be at the personal responsibility of the rulers of the nation if they do not minutely examine into the state of the colony, which is infinitely worse than they expect, or have ever been informed. Yes, it is unpardonable neglect when the parties interested in the colony omit to represent the causes of the bad state of affairs and the means available for redressing these grievances, and establishing order by a reformation of the constitution.”

On the 24th of February, 1785, a protest or memorial was forwarded to the Directeur-General, JAN L' ESPINASSE, of which the following is the substance :—

The undermentioned planters and inhabitants of Demerara and the sea-coasts thereof make known : That by the publication of the 11th of this month we have been informed :

That the President, Representatives, and Directors of the West India Company, in taking over this river, have dismissed all the officials, both high and low, as well as the Councillors :

That in the last meeting of the Ten at Amsterdam, JOSEPH BOURDA, CORNELIS OVERBROEK, and PIETER VAN HELSDINGEN were elected as Councillors :

That the second person above-named has died since, and the two others have refused to sit as Councillors on the election of the Company ; therefore three seats are now vacant.

In consequence of the authority given to the Commandeur and the Councillors by resolution of the Ten, there are at present, as Councillors of Policy and Civil and Criminal Justice, only Messrs. C. J. HECKE and F. C. CHANGUION. To fill the third vacancy a nomination has been sent to the Directors.

The undersigned beg to call the attention of the Directeur-General to the following :—

That the Colonial or Burgher Councillors are appointed and chosen from and through the Burghery ; they could not therefore be included in the high and low servants, who by the transfer of this river are considered as being discharged and deprived of their service and employment by the Directors :

For these Colonial Councillors have never been considered here as servants of the Company, but entirely distinct :

They have also at all times been admitted by the Ten as separate.

The undersigned are not going to bring proofs of old date, or before this river received a separate government, but will be satisfied for the present to call your attention to the sixth article of the Instructions of the Ten to the Commandeur and Councillors of this river, dated the 22nd of March, 1773 :

Which instructions received the sanction of their High Mightinesses on the 7th of April the same year :—

“In respect to matters of importance, and the carrying out of statute laws and regulations, as well as in the proclaiming and publishing of all orders, the Commandeur will be bound to convoke his Council, consisting of the Commandeur, Captain Commandant, Fiscal, Vendue-Master, and four of the most important, intelligent, and pious of the inhabitants ; and the aforementioned before taking their seats shall take the oath in the form provided.”

These Colonial Councillors were continued during the English and French occupation :

When the Directeur-General was ordered to discharge all the Company’s servants, he also dismissed the Councillors who were not servants.

The College of Keysers, who were citizens acting for all the inhabitants, nominated Councillors as early as 1747.

The Council should consist of eight members, four being servants of the Company and four citizens.

The Keysers, as constituted by resolution of the 15th May, 1776, nominated three for each vacancy, from which one was chosen. The College of Burgher Officers is the same as that of the Keysers.

The citizens wish every one to have a vote.

The Council of Ten reserved the right to continue or appoint a new Colonial Council after each session.

The late dismissal was unconstitutional and might give rise to disturbances, as many planters would probably refuse to obey the new Council.

The undersigned ask that JOSEPH BOURDA, WILLE-BORDUS RAMAKER, ANTHONY PIETER SWAAN and PIETER VAN HELSDINGEN, be allowed to take their seats, as they are considered by the citizens as still legally holding their offices as Councillors.

This protest was thus noted in the margin :—The request cannot be entertained, the undersigned being unable to alter the Company's resolution ; the petitioners are referred to the Company, and if anything disagreeable comes of it they must blame themselves.

(Signed) JAN L' ESPINASSE.

The Directeur-General and Council in a letter to the Council of Ten, dated February 15th, 1786, give a *résumé* of the state of affairs in Demerara as follows :—

The new arrangements for government, policy, and justice, made by the Ten, have been entirely opposed by the inhabitants, who refuse to accept any alterations whatever, especially the following :—

1.—Appointment of Council without consulting the citizens.

2.—Raising of the Head Tax to £6.

They have petitioned that affairs be left on the former

footing and that the increased head money be abolished, which request has been refused by the Directeur-General, he not being empowered to make any alterations, or to refuse to carry out his instructions.

It had been published that the planters should send in their returns for the assessment of the Head-Tax on pain of a fine of £300. Very few having sent in their returns, a second publication was made, extending the time with a double fine, but still very few reports were received. The Directeur-General thereupon summoned five of the most influential, and inflicted the fine, which they refused to pay. They sent a letter to the Fiscal, of which we enclose a copy. A Council was then held, the minutes of which are enclosed. We have ordered the sentence to lapse, and do not intend further action until we learn your decision.

Minutes of an extraordinary meeting of the Court of Policy, held at Stabroek, November 28th, 1785.

A letter from the Fiscal was read, enclosing another letter from the planters summoned to appear before the Commissary to-morrow.

The Directeur-General said that the planters called the Court a "Pretended Council;" this he considered very impudent. The letter contained threatening language and was, in his opinion, treasonable. If they had appealed to the Court they might have had some indulgence; instead of which they had sent to the Fiscal, as if that gentleman were able to decide. To maintain their dignity they were bound to take notice of it. It also threatened danger to the colony. He wished the Court to deliberate as to what ought to be done under the circumstances. In his opinion, the Fiscal should

not allow himself to be deterred from his duty, but go on with the prosecution.

Mr. MEERTENS, the Fiscal, considered that if the four leaders, who were Messrs. ALBINUS, SANTHEUVEL, HARTSINCK, and JONAS, could be made to pay, the other planters would soon follow:—

Letter to the Fiscal.

“ Having already asked the Directeur-General to allow matters to remain on the old footing, we expected a different answer. This provocation has not however made us lose our temper; we know taxes must be raised and we are quite willing to pay at the old rate; this proposition might have been accepted. Instead of making peace, the action of the Directeur-General served only to stir up strife. We dispute the authority of the Council to either impose the fine or fix the Head-Tax at *f6*. We do not consider ourselves justified in paying this. We thought that the decision of the Stadholder on our memorial might have been awaited. The order to give in the slave return has been improperly given, as the taxes are not due until November, while the returns were to be made in September. No ships arriving before February, the produce will not be ready in time for the tax in November, this not being crop time. We have to complain of the Fiscal imposing this fine. We received the citations, but did not think them of any importance, not troubling ourselves or losing our tempers. We propose to let the matter stand, but we are not afraid. We don't want any disturbance, but if any does take place, we shall place it to the account of those who force the matter.”

Four points were considered by the Court.

- 1.—Resolution of the Directors, July 22nd, 1776.
- 2.—As to the continuance of the citation.
- 3.—As to the style and wording of the letter.
- 4.—As to the competency of the Court.

It was finally decided not to proceed to execution until the Court is further advised, and in the meanwhile to pay no attention to the language of the letter but leave it to their High Mightinesses.

(Signed) JAN L'ESPINASSE, A. MEERTENS, F. C. CHANGUION, J. ANDRIESSEN, Sen., and J. L. C. v. BAERLE, Secretary.

The following is one of the latest of the petitions:—
Letter from the planters and inhabitants of Demerara to the Gentlemen Directeur-General and Fiscal.

“ Highly honoured and most respected gentlemen,

“ The undersigned, planters and inhabitants of this river, find themselves compelled most respectfully, but at the same time powerfully and earnestly to bring to your notice:—

“ That it is an irrefutable truth, that when the inhabitants of a province, colony or village, form part of a state:

“ And, through a strange concourse of complications in connection with questionable arbitrary acts done in the said province, colony or village,—they remain without any decisive answer from their rulers, who are the highest representatives of the people:

“ The inhabitants are at liberty, provisionally and until the will of their rulers be made known, to establish such order as is necessary, to prevent that confusion which naturally follows the absence of a proper government. If this right is indisputable (which nobody can contra-

dict) then are there no people anywhere more fully justified in doing this than the undersigned.

“ The Directors, being the gentlemen in charge of the West India Company, thought fit in their meeting of the Ten in 1784, to kick out the bottom of the original basis of a true representative government, which had been in force as a constitution from the very oldest times of the colony.

“ The duty of free-born subjects compelled the planters and inhabitants of this river to enter their opposition against this arbitrary act.

“ Being enemies to no government, it followed that they proposed to the Gentleman Directeur-General, that those Councillors, who are *de jure*, but not *de facto*, should be provisionally allowed to sit in the Council; far from being heard, however, they received a sharp and shameful repulse, which, if they had represented as it deserved, the results would have been deplorable.

“ However, not being intimidated by this, much less induced to neglect their duty, they offered to pay the head and colonial taxes on the old footing:

“ This act of moderation, which might have been allowed in compliance with their request, was also refused, and we have been referred to the Directors.

“ In obedience to this, as in duty bound, we, the planters and inhabitants, presented a petition to the Gentlemen Directors of the West India Company, in which it was asked that the Councillors who are legally qualified should be admitted into the Council, and, further, we offered to pay the taxes as above-mentioned.

But these Directors were as little inclined to be

accommodating to the inhabitants of these rivers as their Directeur-General, and not even to prevent disorder, that might result from an absence of government, have they deigned to make any appointments.

"In the meanwhile, there being plenty of evidence forthcoming, or at hand, to allow us to judge as to what are the opinions of the Directors towards us, we addressed ourselves to their High Mightinesses by petition, to which we added a very concise memorial supporting our objections, which petition, having been received by their High Mightinesses, was at first, as customary, put in the hands of the Directors for report. Had these reporters (as in duty bound in respect to the wishes of the inhabitants of these colonies, whom they knew to be without proper rulers, and also in consideration of the respect due to the state) answered speedily, to-day, yes, even long ago, it would have been possible to have had a proper government introduced into these two rivers :

"But no ; they allowed eleven months to elapse from the date the Directors had received the petition, before their report was sent in to their High Mightinesses :

"From which it has followed, that, on account of the intricacy of the affair (it not alone concerning these, but also other colonies), the gentlemen delegated by their High Mightinesses to confer with the West India Company could not bring in their elaborate report before the 19th of March of this year.

"From the unlucky events which have since taken place in the Republic, this, as well as other conferences on matters affecting the Union, will be most difficult, and, for a time, impossible, which makes the under-

signed afraid that a considerable period will elapse before conferences can be held over this report, and resolutions passed upon it. The undersigned cannot flatter themselves by any hopes of receiving a speedy settlement from the Gentlemen Directors, as they have represented to their High Mightinesses, that the Council of Ten had separated for the recess, and that through want of money the colonies would remain not only without officials, but also without even the usual supplies. After the above short recapitulation of the events which have occurred, as well as of the present state of affairs in Europe, the undersigned now proceed to inform your Honourables of what is the position of matters here :

“ Of the four Company’s officials, who, together with the four Councillors chosen by the citizens, should form the Political Council, and, with the exception of the Gentleman Fiscal, also the Court of Justice, we must inform your Honourables, that there are no more than two at present in the Colony ; the other so-called Councillors are persons who have been assumed, but have never yet been approved by the Directors, although they have sat for three years ; they are therefore, as we said before, unqualified and incompetent, either as Councillors of Policy or Justice ; moreover, the Court of Justice is incomplete :

“ And, with the exception of your Honourables, the undersigned are really without any governing authorities in these rivers.

“ These are not only the opinions of the undersigned, but, judging by the expressions of the delegates of their High Mightinesses in their report, their thoughts as

well, as may be seen in the way they express themselves on page 21 :—

‘It has been intimated to the Committee of Directors, the great necessity that exists, to provide as soon as possible against the continuation of the present confusion, and to prevent what may result from the existing state of *no government* in the colonies of Essequebo and Demerara.’

“ This expression plainly shows that the Council appointed in 1785 by the Gentlemen Deputies has not been considered as a College of Government.

“ The undersigned had flattered themselves that this report (already in the Colony for so many months) would have induced the Gentleman President to reconsider matters: But far from this, this Honourable, with what he on a certain occasion called his Court, continues to pass sentences and make appointments, in which the rules of justice are overstepped, and to which his (so-called) Court blindly gives consent.

“ Further, the undersigned have noticed the publication of rules as to anchoring and lying off the fort after sunset of all vessels great or small, prohibiting their either entering or leaving. This was given out by the Directeur-General under a pretence of non-session of the pretended Court, which, however, assembled in the same week, on the day before the publication, as well as that following, by which despotism is being attempted, for it says, “for reasons, us thereunto moving.” In the meanwhile, even before this beautiful publication was known, they fired with shot, (although this was not inserted in the publication) all the boats being detained until the following day, even some that arrived before sunset.

“ From the foregoing acts it appears to the undersigned that they imagine their quiet conduct to be the result of want of spirit and carelessness, and that the undersigned appear as if willing to lay down their necks upon the block of despotic tyranny.

“ Therefore they have considered it right for their own justification, as well as for their descendants and the people who in future may inhabit this beautiful colony, to apply to your High Honourables: earnestly insisting and beseeching you to put an end to this state of *no government* in the most suitable manner. And, it certainly appears to the undersigned, that the gentlemen deputed by their High Mightinesses to enquire into the allowing of what is lawful, (that is, the sitting of the Councillors chosen from and by the citizens), have not sufficiently explained themselves in the aforementioned report.

“ The best, most prudent, and what appears most in unison with the intention of the supreme government, which in affairs of this nature generally acts in accordance with the propositions embodied in the Reports of Committees, would be to provisionally introduce a government on the model proposed in pages 25 and 26 of the aforementioned report.

“ The undersigned insist the more strongly on this matter, as the Gentlemen Deputies express themselves as follows in the Plan of Redress:—

‘ In case the colonists, upon the proposed ‘Redress’ or any part of the same, should bring forward any important considerations, their High Mightinesses would be willing after due examination to reflect thereon, as far as their High Mightinesses may think necessary, so

as to arrive at the desired result, provided the 'Redress' is carried out and is at once adopted.'

"The undersigned are under the impression, that by hastening the introduction of the new plan of government the true intention of the gentlemen reporters will be fulfilled.

"On the contrary, it appears that by continuing these Councillors, who even by the Committee of their High Mightinesses, have not been acknowledged as rulers, would be an act very displeasing to the Stadholder.

"With this, the undersigned, as in duty bound, have laid before you all they wish to say, supported by sufficient proofs; they hope their wishes may be carried out, so as to prevent the undersigned being compelled to make use of acts against the pretended Councillors which would be unpleasant to every one.

(Signed by 76 persons.)

"Rio Demerary, October 2nd, 1787."

The Plan of Redress referred to in the above petition was the well-known document which has formed the Constitution of these colonies for a century. In 1789 the protests of the colonists were taken into consideration and two Commissioners sent out, one being W. A. VAN SIRKELA, Baron GROVESTINS, and the other, S. M. VAN, with authority to enquire into the points of the dispute. The Commissioners returned to the Netherlands in August, 1790, bringing with them the Directeur-majoor who had been allowed to resign, while the Commandant of Essequibo acted provisionally as Governor of the united Colony of Demerara and Essequibo. In 1791 the Charter of the Company expiring, renewal was refused by the States General, and it was

compelled to wind up its affairs. There were plenty of protests against this, which the Company thought a very high-handed proceeding, but there was no choice left to the Directors. Their High Mightinesses took over the shares at thirty per cent., giving bonds bearing interest at 3 per cent., which, considering that the Company was insolvent, and had paid no interest for many years before, were very fair terms. The following year the colonies were put under the control of the Colonial Council of the Netherlands, under which superintendence the trade was doubled in two years.

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The West Indian Bundle of Sticks.

By N. Darnell Davis.

MANY years ago, in the earliest days of the making of the Suez Canal, a solitary Frenchman was observed digging away on the Isthmus. Asked what he was about, the lonely pioneer made answer, "*I am digging the Suez Canal!*" Somewhat similar to the rôle of that solitary Frenchman is the part now being played by those earnest men who, scattered far and wide throughout the British Empire, are working slowly but surely in the cause of Imperial Federation. These true patriots have made a beginning of a grand work. They are, it is true, merely digging away for the foundations, which must be laid wide and deep in the common welfare. They can hardly hope to live long enough to see the completion of the Imperial superstructure. Nevertheless, animated by the noble enthusiasm which inspires them, they cease not to proclaim the patriotic sentiment that Englishmen who go forth to East or West, to North or South, should remain Englishmen still, and that, the wide world over, Englishmen should stick to one another, and to the Old Country, in lasting Union.

In order to insure that Imperial Federation shall be accomplished in the future, it is necessary that steps be taken in the present for the consolidation of the outlying parts of the Empire. In this direction British North America has led the way by the formation of the Dominion of Canada. In Australia, the colonies have been visibly drawing together in the common interest,

from the time of the convening of the Conference upon the New Guinea question, in 1883, to the common action taken in 1889 in favour of granting Responsible Government to Western Australia. There are unmistakeable signs in South Africa that colonies and republics, both, will ere long join hands, and the tendency thus to combine forces will receive an impetus so soon as Natal obtains Responsible Government. In the West Indies alone, of the large groups of colonies, is there stagnation. It is true that, in recent years, a Federal Government has been invented for the Leeward Islands, and that the Islands of St. Kitts and Nevis in that Government have together been incorporated into one colony. It is also true that Tobago has been tacked on to Trinidad, with the proviso that the revenue, expenditure, and debt of each colony shall be kept distinct. The colonists, however, have but little sympathy with these more or less official arrangements, and, after all, something stronger than red tape is needed to hold the Bundle of Sticks together. An examination into the nature of our West Indian Polity will convince any thinking person that the tendency of existing arrangements is to keep the colonies apart, rather than to draw them together.

When, in February, 1889, the present Governor of Jamaica, set out from England for his Government, *The Times*, supposed to be well-informed in matters of State, described Sir HENRY BLAKE as *Governor and Commander-in-Chief of the West Indies*. Were it not for the blighted hopes of several worthy colleagues who are awaiting promotion to their proper sphere and duty, one would be inclined to express the hope that *The Times* spoke prophetically. Far different, however, is

the real state of the case. There are six distinct and separate governments in the British West Indian Islands.* These are the Governments of Jamaica, the Bahama Islands, Barbados, the Windward Islands, the Leeward Islands, and of Trinidad, each of which has its own Governor-in-Chief. Barbados and the Bahamas have Constitutions of the free-born Englishman kind, survivals of the old King-Lords-and-Commons type: that is to

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	Population.	Revenue.	Expenditure.	Imports.	Exports.
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Jamaica	580,804	590,192	613,960	1,322,336	1,509,010
and Turks' Islands	4,732	8,350	6,378	26,727	26,015
Total ...	585,536	598,542	620,338	1,349,063	1,535,025
The Bahama Islands	43,521	45,869	43,955	189,456	125,464
Barbados	180,000	163,489	154,610	983,187	1,063,397
The Windward Islands —					
Grenada	48,346	46,743	44,804	143,185	217,949
St. Lucia	42,300	39,967	43,598	115,626	117,743
St. Vincent	45,000	29,399	29,720	79,702	85,770
Total ...	135,646	116,109	118,122	338,513	421,462
The Leeward Islands —					
Antigua	35,000	44,032	40,773	145,227	152,036
Dominica	29,500	15,702	16,774	46,890	48,105
Montserrat	11,000	5,803	5,718	27,844	24,216
St. Kitts & Nevis ...	45,000	40,616	40,180	179,583	223,840
Virgin Islands ...	5,000	1,745	2,088	3,039	4,494
Total ...	125,500	107,898	105,533	402,583	452,691
Trinidad	183,486	456,167	424,594	1,918,670	1,870,612
and Tobago	20,335	9,387	6,995	23,117	32,907
Total ...	203,821	465,554	431,589	1,941,787	1,903,519

say, a Governor with a Council and Assembly. The Councillors are nominated by the Crown, the Assembly-men are elected by the people. Different from this old-fashioned system are the constitutions of the four other Governments, which, again, are all different from one another. Jamaica and the Leeward Islands have each their Legislative Council, in each case partly nominated and partly elected, but, whereas in Jamaica the Governor presides over the Council with a slight official majority, in the Leeward Islands the Governor has no seat in the Council, where the Official and Elective votes are equal in number. In Trinidad, with which is now coupled Tobago, the Governor presides over the Council of seven Officials and nine nominated members. The Government of the Windward Islands is for the most part a political expression. Each little colony preserves its autonomy, but by Letters Patent the Islands of Grenada, St. Lucia, and St. Vincent, with their dependencies, have the same Governor. As if, however, six separate Governments were not sufficient, there needs must be subordinate legislatures in some of the colonies. Grenada, St. Lucia, and St. Vincent not being united, even Federally, each enjoys a Council all to itself. The Turks' Islands, an appanage of the Government of Jamaica, not only have laws made for them by Jamaica, but have a Council of their own to make more laws for them. In the Leeward Islands, besides the Federal Council, Antigua, Dominica, Montserrat, the Virgin Islands, and St. Kitts-Nevis, must needs have each a local legislative council, again of different sorts, to make laws for its own little self, just as it seems to be absolutely necessary for each to have its own postage stamps and its own tariff

There are some thirteen different tariffs in operation amongst the British West Indian Islands, and the same number of sets of postage stamps in use, and this where some of the colonies are within sight of each other on a fine day. One would expect to learn that the Abbé SIEYES, and not ALEXANDER HAMILTON, the great Federalist, had been born in one of these islands.

If the Colonial Policy of Great Britain were administered on the principle of *divide and govern*, one could understand the peculiar condition of isolation in which the several West Indian colonies stand towards one another. Imperial statesmen are, however, openly favourable to the consolidation of the outlying parts of the empire, and Secretaries of State have indeed shown themselves over anxious to secure the confederation of some of the West Indian Islands. Bygone attempts to force UNION upon some of these colonies have not forwarded, but have seriously hindered the good work, so it cannot be too often enjoined upon those who would "rush" the joining together of even two colonies, that Union, Confederation, and Imperial Federation, all and each must grow, and not be forced in their growth, and that they must grow up amidst the colonists themselves. There never was a more earnest, well-intentioned Imperial Unionist than King GEORGE III., and yet the very vehemence of his objections to the dismembering of the empire was a main cause of the loss to Great Britain of a vast Colonial Empire.

The struggle against the system of bounties upon sugar has laid bare the weakness inherent in the condition of isolation in which these colonies stand towards one another. Petition after petition has been addressed

to Parliament by the several islands, but these appeals have lacked the force which a solid Union of the colonies would have given to a collective protest. The unfamiliar names of some of the smaller islands could hardly be expected to attract the attention of the majority of the members of the House of Commons. A single petition from the British West Indies, united together, would, on the other hand, have commanded attention: if, indeed, the West Indies, when united, would need to make such an appeal. Since the British North American colonies joined together in a single commonwealth, Imperial ministers have found themselves in a position to allow the Dominion of Canada to adopt its own Commercial Policy: surely, then, a Union of the West Indian Islands would be allowed to consult its own interests in matters of trade. As things are, however, we have been plainly told, what we had already been made to feel, that the commercial interests of these colonies are to be held in subjection to the commercial interests of the mother country. Never did a government try to do a better turn to the West Indies, than the ministry now in power has attempted to do, by its efforts to secure the abolition of the Foreign Bounty system, and yet a minister of the Cabinet, in a speech against that system, openly declared the subjection of our commercial interests to those of the United Kingdom. Here are the Right Honourable C. T. RITCHIE'S own words:—

“ What is the position of the West Indian colonies in this matter? They are debarred by their connection with this country from making arrangements for the export of their sugar to foreign markets on terms of mutual advantage. We will not permit them to do so.”

The last sentence is no flight of oratory, but the simple truth, as West Indians know well. Was it not only so lately as 1885, that these colonies were not permitted to enter into an advantageous convention with the United States, which had been successfully negotiated by the British minister at Washington, ably assisted by Mr. NEVILLE LUBBOCK, the Chairman of the West India Committee?* And so it has been for more than two centuries. For a long time the West Indies were bound hand and foot by the Navigation Laws. In the present century, the necessities of a policy of Free Trade have admitted slave-grown sugar on the same terms as those accorded to sugar from the British colonies, where slavery had been abolished. To-day, the foreign sugars produced under a system of bounties are admitted on equal terms with sugar grown in the West Indian Islands —to the great injury of the latter. It is no sufficient answer to the West Indian to tell him that the Bounty system cheapens sugar for the English consumer, and the sacrifice of the producer in favour of the consumer is a matter about which the English producer is likely to have something to say, now that he has a vote. This

* As some of the islands had been old English colonies even before the Union of Scotland with England, it was far from pleasant for the islanders to learn, in the earlier stages of the negotiations, that the British West Indies were not entitled to the most favoured Nation treatment, at the hands of the United States. This disability was the outcome of the Navigation Laws. When the Commercial Convention of 1815 was being arranged, the Americans desired to share in the West Indian trade, but the British Government would not hear of their doing so. In later years, modifications were from time to time made in this Policy of Exclusion, and especially so during the Presidency of General JACKSON, until Free Trade finally gave up everything to the Americans, without relieving the islands from the disability mentioned.

argument of cheapness would make the buying of stolen goods an honest trade, nay, would even justify the stealing of the goods as the cheapest way of getting them. If, nevertheless, the Englishman living in England finds it to his interest to tolerate bounties, why should the Englishman living in the West Indies, whose interest it is that sugar shall not be cheap, not have the right allowed him to make profitable arrangements with the United States? It is not practicable, however, for Secretaries of State, in the face of party interests, to risk an adverse vote in the House of Commons, by allowing such a right to be exercised by straggling colonies which cannot themselves fall into line for their common welfare.

A Union of any two or more of these islands would not be worth much which was not the result of arrangements made by the colonists themselves. Meanwhile, so long as matters are in the state we find them, it may be well to consider how far those who have the power can take steps to pave the way for unification. To all appearance, no policy of assimilating the administration of the islands has hitherto been formulated. Now and again, as in the case of the Law of Quarantine, there has been some common action in legislation, at the instance of the Secretary of State. Such instances are, however, altogether exceptional. Has any one ever heard of any attempt to frame a *Code* of law for the whole group of colonies, or even of any proposal to have a *code* of procedure? So far from any system having been observed, the authorities in each colony have been left to follow their own sweet will: and thus it has happened that colonies which have been captured from foreign powers have, or have not, assimilated their laws

to the law of England. In Trinidad, the Spanish law has been superseded by the English, but, in St. Lucia, the French system of law has not only been retained but has been reaffirmed by the *Civil Code* of that island.* The want of a set policy is the occasion of lost opportunities, by leaving matters to be settled according to the personality of the holders of high offices. Hence, it is not too much to say that, had the codification of the laws of St. Lucia not been taken in hand by Sir WILLIAM DES VOEUX and Chief Justice ARMSTRONG, who were both of them members of the Canadian Bar, but by Chief Justice CARRINGTON, a member of the English Bar, the laws of that island would probably have been assimilated to the English system. Throughout the group, the drafting of laws is engaging the time and attention (with some help of scissors and paste) of some eight or nine law officers, where one ought to suffice : and a word to them from head quarters would soon bring about an assimilation of the laws of the various colonies. To improve the administration of the law, no fitter means could be provided than the establishment of a West Indian Court of Appeal, the very coming into existence of which would be a harbinger of Union. On a smaller scale, such a *Court of Appeal* has been at work in the Windward Islands for many years, with high advantage to the administration of justice among the islanders. By means of it many a forlorn suitor has obtained a favourable rehearing of his cause, who could not have approached the Privy Council, owing to the vast expense inseparable from an appeal to that august tribunal. The right of appeal to the Privy

* In Trinidad, assimilation has extended even to the Law of Inheritance. (*Ordinance 24 of 1845.*)

Council should of course be continued, but it will be a luxury within the reach only of the rich.*

The Imperial Post Office has arranged a common system for Inter-Colonial and Foreign Mail correspondence, but the existing system of cables for telegraphic communication cannot be regarded as satisfactory, and an improvement in it might easily be brought about by joint action on the part of the colonies concerned. The penny postage rate should be at once introduced for Inter-Colonial correspondence, and, although sixpenny telegrams may not be practicable now, much lower rates should prevail than do at present, for cable messages among the islands. The means of internal communication within the islands themselves should be established on a thorough system. There should be in each colony, wherever practicable, a complete network of roads, railways, mail-coaches, and coasting steamers, for, while the isolation of island from island is bad, the isolation of parish from parish is worse. The wires of the telegraph and telephone should even penetrate into the out-of-the-way parts of the several colonies.

Since Corsica has given birth to COLUMBUS and NAPOLEON it would appear that a man may make a great figure in the world, although born in a small island. Nay, was not that man of brilliant genius, ALEXANDER HAMILTON, born in our own islet of Nevis? It is certain, however, that even men like COLUMBUS, NAPOLEON, and HAMILTON, must have a larger stage to play their parts upon. So, though in a smaller way, with

* The Heirs of the late Mr. H. M. A. Black, spent £1,875 :—in the prosecution of their Appeal to the Privy Council, from a judgment of the Supreme Court of British Guiana.

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and Tobago	20,335	9,387	6,995	23,117	32,907	
Total ...	203,821	465,554	431,589	1,941,787	1,903,519	

say, a Governor with a Council and Assembly. The Councillors are nominated by the Crown, the Assembly-men are elected by the people. Different from this old-fashioned system are the constitutions of the four other Governments, which, again, are all different from one another. Jamaica and the Leeward Islands have each their Legislative Council, in each case partly nominated and partly elected, but, whereas in Jamaica the Governor presides over the Council with a slight official majority, in the Leeward Islands the Governor has no seat in the Council, where the Official and Elective votes are equal in number. In Trinidad, with which is now coupled Tobago, the Governor presides over the Council of seven Officials and nine nominated members. The Government of the Windward Islands is for the most part a political expression. Each little colony preserves its autonomy, but by Letters Patent the Islands of Grenada, St. Lucia, and St. Vincent, with their dependencies, have the same Governor. As if, however, six separate Governments were not sufficient, there needs must be subordinate legislatures in some of the colonies. Grenada, St. Lucia, and St. Vincent not being united, even Federally, each enjoys a Council all to itself. The Turks' Islands, an appanage of the Government of Jamaica, not only have laws made for them by Jamaica, but have a Council of their own to make more laws for them. In the Leeward Islands, besides the Federal Council, Antigua, Dominica, Montserrat, the Virgin Islands, and St. Kitts-Nevis, must needs have each a local legislative council, again of different sorts, to make laws for its own little self, just as it seems to be absolutely necessary for each to have its own postage stamps and its own tariff

There are some thirteen different tariffs in operation amongst the British West Indian Islands, and the same number of sets of postage stamps in use, and this where some of the colonies are within sight of each other on a fine day. One would expect to learn that the Abbé SIEYES, and not ALEXANDER HAMILTON, the great Federalist, had been born in one of these islands.

If the Colonial Policy of Great Britain were administered on the principle of *divide and govern*, one could understand the peculiar condition of isolation in which the several West Indian colonies stand towards one another. Imperial statesmen are, however, openly favourable to the consolidation of the outlying parts of the empire, and Secretaries of State have indeed shown themselves over anxious to secure the confederation of some of the West Indian Islands. Bygone attempts to force UNION upon some of these colonies have not forwarded, but have seriously hindered the good work, so it cannot be too often enjoined upon those who would "rush" the joining together of even two colonies, that Union, Confederation, and Imperial Federation, all and each must grow, and not be forced in their growth, and that they must grow up amidst the colonists themselves. There never was a more earnest, well-intentioned Imperial Unionist than King GEORGE III., and yet the very vehemence of his objections to the dismembering of the empire was a main cause of the loss to Great Britain of a vast Colonial Empire.

The struggle against the system of bounties upon sugar has laid bare the weakness inherent in the condition of isolation in which these colonies stand towards one another. Petition after petition has been addressed

to Parliament by the several islands, but these appeals have lacked the force which a solid Union of the colonies would have given to a collective protest. The unfamiliar names of some of the smaller islands could hardly be expected to attract the attention of the majority of the members of the House of Commons. A single petition from the British West Indies, united together, would, on the other hand, have commanded attention: if, indeed, the West Indies, when united, would need to make such an appeal. Since the British North American colonies joined together in a single commonwealth, Imperial ministers have found themselves in a position to allow the Dominion of Canada to adopt its own Commercial Policy: surely, then, a Union of the West Indian Islands would be allowed to consult its own interests in matters of trade. As things are, however, we have been plainly told, what we had already been made to feel, that the commercial interests of these colonies are to be held in subjection to the commercial interests of the mother country. Never did a government try to do a better turn to the West Indies, than the ministry now in power has attempted to do, by its efforts to secure the abolition of the Foreign Bounty system, and yet a minister of the Cabinet, in a speech against that system, openly declared the subjection of our commercial interests to those of the United Kingdom. Here are the Right Honourable C. T. RITCHIE'S own words:—

“ What is the position of the West Indian colonies in this matter? They are debarred by their connection with this country from making arrangements for the export of their sugar to foreign markets on terms of mutual advantage. We will not permit them to do so.”

The last sentence is no flight of oratory, but the simple truth, as West Indians know well. Was it not only so lately as 1885, that these colonies were not permitted to enter into an advantageous convention with the United States, which had been successfully negotiated by the British minister at Washington, ably assisted by Mr. NEVILLE LUBBOCK, the Chairman of the West India Committee?* And so it has been for more than two centuries. For a long time the West Indies were bound hand and foot by the Navigation Laws. In the present century, the necessities of a policy of Free Trade have admitted slave-grown sugar on the same terms as those accorded to sugar from the British colonies, where slavery had been abolished. To-day, the foreign sugars produced under a system of bounties are admitted on equal terms with sugar grown in the West Indian Islands —to the great injury of the latter. It is no sufficient answer to the West Indian to tell him that the Bounty system cheapens sugar for the English consumer, and the sacrifice of the producer in favour of the consumer is a matter about which the English producer is likely to have something to say, now that he has a vote. This

* As some of the islands had been old English colonies even before the Union of Scotland with England, it was far from pleasant for the islanders to learn, in the earlier stages of the negotiations, that the British West Indies were not entitled to the most favoured Nation treatment, at the hands of the United States. This disability was the outcome of the Navigation Laws. When the Commercial Convention of 1815 was being arranged, the Americans desired to share in the West Indian trade, but the British Government would not hear of their doing so. In later years, modifications were from time to time made in this Policy of Exclusion, and especially so during the Presidency of General JACKSON, until Free Trade finally gave up everything to the Americans, without relieving the islands from the disability mentioned.

argument of cheapness would make the buying of stolen goods an honest trade, nay, would even justify the stealing of the goods as the cheapest way of getting them. If, nevertheless, the Englishman living in England finds it to his interest to tolerate bounties, why should the Englishman living in the West Indies, whose interest it is that sugar shall not be cheap, not have the right allowed him to make profitable arrangements with the United States? It is not practicable, however, for Secretaries of State, in the face of party interests, to risk an adverse vote in the House of Commons, by allowing such a right to be exercised by straggling colonies which cannot themselves fall into line for their common welfare.

A Union of any two or more of these islands would not be worth much which was not the result of arrangements made by the colonists themselves. Meanwhile, so long as matters are in the state we find them, it may be well to consider how far those who have the power can take steps to pave the way for unification. To all appearance, no policy of assimilating the administration of the islands has hitherto been formulated. Now and again, as in the case of the Law of Quarantine, there has been some common action in legislation, at the instance of the Secretary of State. Such instances are, however, altogether exceptional. Has any one ever heard of any attempt to frame a *Code* of law for the whole group of colonies, or even of any proposal to have a *code* of procedure? So far from any system having been observed, the authorities in each colony have been left to follow their own sweet will: and thus it has happened that colonies which have been captured from foreign powers have, or have not, assimilated their laws

to the law of England. In Trinidad, the Spanish law has been superseded by the English, but, in St. Lucia, the French system of law has not only been retained but has been reaffirmed by the *Civil Code* of that island.* The want of a set policy is the occasion of lost opportunities, by leaving matters to be settled according to the personality of the holders of high offices. Hence, it is not too much to say that, had the codification of the laws of St. Lucia not been taken in hand by Sir WILLIAM DES VOEUX and Chief Justice ARMSTRONG, who were both of them members of the Canadian Bar, but by Chief Justice CARRINGTON, a member of the English Bar, the laws of that island would probably have been assimilated to the English system. Throughout the group, the drafting of laws is engaging the time and attention (with some help of scissors and paste) of some eight or nine law officers, where one ought to suffice : and a word to them from head quarters would soon bring about an assimilation of the laws of the various colonies. To improve the administration of the law, no fitter means could be provided than the establishment of a West Indian Court of Appeal, the very coming into existence of which would be a harbinger of Union. On a smaller scale, such a *Court of Appeal* has been at work in the Windward Islands for many years, with high advantage to the administration of justice among the islanders. By means of it many a forlorn suitor has obtained a favourable rehearing of his cause, who could not have approached the Privy Council, owing to the vast expense inseparable from an appeal to that august tribunal. The right of appeal to the Privy

* In Trinidad, assimilation has extended even to the Law of Inheritance. (*Ordinance 24 of 1845.*)

Council should of course be continued, but it will be a luxury within the reach only of the rich.*

The Imperial Post Office has arranged a common system for Inter-Colonial and Foreign Mail correspondence, but the existing system of cables for telegraphic communication cannot be regarded as satisfactory, and an improvement in it might easily be brought about by joint action on the part of the colonies concerned. The penny postage rate should be at once introduced for Inter-Colonial correspondence, and, although sixpenny telegrams may not be practicable now, much lower rates should prevail than do at present, for cable messages among the islands. The means of internal communication within the islands themselves should be established on a thorough system. There should be in each colony, wherever practicable, a complete network of roads, railways, mail-coaches, and coasting steamers, for, while the isolation of island from island is bad, the isolation of parish from parish is worse. The wires of the telegraph and telephone should even penetrate into the out-of-the-way parts of the several colonies.

Since Corsica has given birth to COLUMBUS and NAPOLEON it would appear that a man may make a great figure in the world, although born in a small island. Nay, was not that man of brilliant genius, ALEXANDER HAMILTON, born in our own islet of Nevis? It is certain, however, that even men like COLUMBUS, NAPOLEON, and HAMILTON, must have a larger stage to play their parts upon. So, though in a smaller way, with

* The Heirs of the late Mr. H. M. A. Black, spent £1,875 :—in the prosecution of their Appeal to the Privy Council, from a judgment of the Supreme Court of British Guiana.

our islanders: to increase their usefulness, it is necessary that those in the Civil Service shall be shifted from one colony to another as opportunity offers, to rid them of some of their native insularity, to free them from local influence, and to widen their view of men and things.* Not only to the officers themselves, and to the Civil Administration, will such transfers be beneficial, but they will be the means of fostering Union among the colonies by creating new ties amongst the colonists. In like manner, every opportunity should be seized for bringing together the public men of the several islands, whether by conferences or otherwise, and care should be taken to select unofficials in equal number with officials, as representatives.

As the question of Defence is at the present time engaging the attention of the authorities, but little need be said here upon that subject. To those, however, who are not mere Cockney Colonists, here to day and off to-morrow, but who are rooted in the islands, it is certain that all obstacles to the growth of a bold peasantry, and of a yeomanry as well, ought to be cleared away. The greater the number of those who become holders of land, the more numerous will be the "native swords and native ranks" of the citizen soldiers of the islands.

That there should be some uniformity in the frame-

* The tendency to narrow the outside world down to one's own standard, which is characteristic of untravelled persons, cannot better be illustrated than in the case of two gentlemen of Barbados who visited England for the first time. Landing at Southampton, they put up at an hotel. On going to bed one of them called a waiter and gave him the following order:—"Waiter, call me at five o'clock in the morning. My brother and I will take a ride round the island before breakfast!"

work of the governments of the islands seems beyond argument. Any system to be applied hereafter should be of as liberal a kind as existing circumstances will admit, while keeping in view its gradual enlargement in the future, until the time shall arrive when the colonies, united together, may be granted one legislature for all, on the plan of those now enjoyed by Barbados and the Bahamas, if not something better. In new-modelling the existing multiform system of a single chamber, it would be well to constitute a Council, to consist of equal numbers of officials and electives. The electives, again, might be equally distributed between the landlord and the other interests, by the allotment of half the seats to the country districts and half to the towns and villages, and by requiring that country members shall be qualified by the possession of a fixed number of acres of land in cultivation, while the representatives of the towns and villages shall need the qualification of a certain annual income. Whatsoever be the plan adopted for the future government of these beautiful islands, let no impious hand attempt to touch the constitutions of Barbados and the Bahamas, whose islanders "feed the eternal flame" of English Liberty, for the political enlightenment of their neighbours.

*Primitive Games.**

By Everard F. im Thurn, M.A.

GHE natural history of games, in spite of a very few brilliant essays which have been produced on the subject, chief of which is Dr. E. B. Tylor's Royal Institution Lecture of the 14th of March, 1879, published in the *Fortnightly Review* for May of that year, to which essay I shall have frequent need to refer, is still very obscure. The subject as a whole has not, to the best of my belief, been put even into rough order. When some two years ago, in connection with the games of the Indians of Guiana, I began to turn my attention to the subject, and when I applied to various friends and correspondents, Dr. TYLOR in England, Dr. GATSCHE, Mr. HENRY PHILLIPS, Jun., and Mr. MACFARLANE DAVIS in America, for information, all of these gave me more or less help, some very important help; but I found that the term "games," in its modern and usual intention, does not express with sufficient extension and definition all that should be included under it when used, as here, to express a subject for study. Yet it is difficult to find, I have failed to find, a better term. One correspondent, in answer to my complaint of this difficulty,

* Some of the descriptions of Guiana games here given I have already printed at various times in the *Demerara Argosy*; but I think they may well take their place in this collection of more permanent form, and I have even thought it well to republish them much in the same words as those in which they were told before—for these narratives were written down by me either as the games proceeded or within an hour or two after, and therefore doubtless have some additional vividness.

kindly noted down the following wealth of synonyms :— amusements, diversions, entertainments, sports, games, relaxations, play, merry-making, frisks, and frolics. But no one of these taken by itself seems to me better than the word “games;” and even the whole list collectively does not by any means cover all that is required. Anthropologists seem to me either unusually liable to suffer from the insufficiency of adequate terms or to be peculiarly non-inventive in supplying this defect. That one equally terrible and unavoidable word “savage,” used to express a man in an uncivilised state (it really, by the way, means a woodman or man of the silvage) has never yet been replaced by anything more satisfactory. As, in default of a better, we still use the word “savage,” so, equally in default of a better, I must here continue to use the word “games.” Hence it is necessary to define the meaning of this latter word as here used; but this definition itself is no easy task.

A game is any exercise of any of the bodily or mental faculties without any other purpose than, either the mere enjoyment of the exercise or (2) of developing the faculties exercised, or (3) of exciting a fervid state of mind, the latter generally for religious purposes.

I do not, on this occasion, intend to examine or prove the truth of this definition. I only wish to point out that it includes not only all that in common thought we class under the name ‘games’ but also dances in all their many forms, uncivilized and civilized, non-religious and religious; games of imitation whether, as in the case of many children’s games, of the doings of their elders or, as in many games both of children and adults, of the doings of animals; games of endurance, and many others.

Probably one of the simplest games of all, one which has originated again and again, spontaneously among almost all people, is ball-play. And the development of this most simple game has been marvellously great, greater perhaps than in the case of any other game. At different times and in different places, ball-play has become associated with the rhythmic movements of the dance. Ulysses, wrecked and cast up by the sea on the shores of Phœacia, watched from his hiding place the rhythmic ball-dance, accompanied by song, of Nausicaa and her fellow Greek maidens. And to this day, though the use of the ball has long been dissociated from the more civilized forms of dance and song, we still speak of certain forms of dances as balls and ballets, and of certain songs as ballads.*

Disassociated from the dance, the simple game of ball-play has developed, when, as Dr. TYLOR well expresses it, the *passion of play* arose, in quite other directions, through polo into hockey, and thence into the innumerable games which are more or less familiar to us, as stool-ball, pall-mall, croquet, foot-ball, cricket, and tennis.

It must be taken on trust, at least for the present, that each, at any rate of the earlier stages in these lines of development of ball-play, has been brought about by some great change in the circumstances of the players. And more often than not this great change has probably been a migration from the old to some distant new quarters. Consequently, phases of this ball-play, in a greater or less degree of development, have to be looked for all over the world and among all people. Ball-play,

* See Tylor, *Fortnightly Review*, May, 1879, p. 737.

except in its simplest form, is therefore an artificial game as distinguished from a natural game, which latter may be defined as a game, such as ball-play in its simplest form, which has originated spontaneously among the people who now play it, and has not been derived from any other people or been developed from any game imported from elsewhere.

We thus come to the one great division which has as yet been made in the classification of games; and according to it all games are divisible into the two great classes of natural and artificial games. The latter are, of course, much the most numerous and the most prominent; and it is consequently these which have been almost exclusively studied by the few who have turned their attention to the whole subject of the natural history of games. On the other hand, it happens that our Red-men are still in that condition in which artificial games are entirely, or almost entirely, unrepresented. Their games are natural games, and are therefore valuable as material to be used in the comparative study, as yet almost unattempted, of natural, as distinguished from artificial games.

Most of the children's games, for we will deal with these first, are dramatic representations either of the doings of their adult friends or of animals. Just as in our own civilized society we constantly see children playing at marrying, and burying, and preaching, and at coaching—in a church paper which I happened to glance at the other day I even saw a serious complaint made that parents are allowing their children to play at "Jack the Ripper,"—so do the Macoosi children about the Pacaraima Mountains play at "coming from town." It must

be explained that a visit to town is a very rare event, falling to the lot of but very few of these remote Indians, and when it does happen making a correspondingly deep impression on their minds. When such journeys do occur a principal feature in them is the purchase and bringing home of a number of small articles to which the travellers take a fancy. So this important event has given rise to a game.

All but two of the players, seated on the ground, the one behind the other and each clasping the player in front of him, form a long line, which, by the motion of the feet and thighs of its members, drags itself slowly forward, the whole swaying from side to side, and in some mysterious way closely imitating the forward rolling motion and noise of a long and well-manned canoe. Then the two players not included in the canoe—these two alone not having been to town—pass down, one on each side of the line, and as they come to each squatting figure seize the feet and make the owner of the foot name some object that he is supposed to have purchased for each toe—a razor it may be for the big toe, a gun for the next, cloth for the next, hair oil for the next, and a “chimney-pot” hat for the little toe. The greater the imagination shown in the choice of goods, and the greater the incongruity of these, the louder are the shouts of laughter from the spectators.

When each player has given an account of his purchases the game is extended in a way and to an extent which might apparently be indefinite. First, rain overtakes the travellers—that is, the two detached players seize a long pole, each by one of its ends, and applying this to one side of the line of squatting tra-

ellers, force the whole lot of them over on their sides on to the ground, as heavy rain lays long grass. Next, the travellers turn over so that they lie no longer on their sides but flat on their backs, but still in line. Then the two home-stayers hold the pole longitudinally over the nearest of the prostrate travellers, and he seizing the pole with his fingers and toes is carried across the play-ground and placed, still flat on his back, in another place. Then the next is lifted in the same way and ranged side by side with the first; and this is continued, two sometimes being carried on the pole at once, until the whole line of travellers has been removed and deposited in the original regular order in a new place. This is portaging the boats and goods overland to avoid the worst falls on the homeward journey. Next the two home-stayers, one after the other, run quickly along the line, finding room for their feet in among the legs of the prostrate travellers, who it must be remembered are placed as closely as possible the one beside the other, and who endeavour vainly, by the movements of their legs, to upset the runners. The boat is being guided through the intricate system of rocks which in the dry season block the stream. Then the home-stayers, taking each traveller in turn by the head, raise the perfectly stiffened bodies on to their feet. As soon as this has been accomplished each individual in the line falls forward on to his hands and feet, his thighs the highest part of him. Thus the whole line of players forms with their closely pressed bodies a long tunnel through which each player in turn has to creep as best he may, as a canoe through a tree-arched creek.

The following are some Macoosi children's dramatic representations of the doings of animals:—In the kaikoosi, or jaguar dance, all but three of the players form one long procession, each player with his hands on the shoulders of the one immediately in front of him, and then the whole procession winds here and there, with rhythmic sway of bodies from side to side, and with rhythmic monotonous chanting of the words "*Kai-koosi brahma celeribè.*" ("There is no jaguar here to-day.") Then from the encircling crowd of onlookers breaks a player, one of the three omitted from the procession, and he, moving on his two hands and one leg—the other leg held high in the air to represent a tail—is the jaguar whose task it is to catch the hindmost member of the procession before its leader, encumbered by his followers, can turn and face the dangerous beast, and then to carry him off and place him among the spectators. One thus caught and placed, the next has to be caught also, and so on until all the members of the procession have been removed to the jaguar's lair among the spectators. The two other players not involved in the procession are two small boys who, on 'all-threes,' imitate the jaguar cubs, running here and there after the full-grown kaikoosi, doing nothing else, but adding considerably to the picturesqueness of the scene.

In the monkey dance all form in single file and move in procession, but very quickly, and with ever quicker and quicker movement until a considerable pace is attained; they wind round and round the open space, and across and across it, till, at a sudden and unexpected signal from the leader, the line is in an instant broken, and, so quickly that it is impossible in the half-light to

see the thing done, each player has a smaller player, or two, on his shoulders, and all are chattering, and squealing and gesticulating, and running without order hither and thither, but none ever passing far from the central troop which they form. It is a curiously close imitation of a troop of monkeys when sometimes these are of a sudden alarmed and angered.

Another game represents an acoorie in a pen and the attempts of a jaguar to get him out of it. The players form a ring, their faces inwards, their arms round each other's necks. Inside the circle thus formed one player crouches, as an acoorie inside a pen. Outside the pen another player watches ; it is the jaguar looking with hungry eye on the acoorie. He tries to get the acoorie out between the bars of its pen—that is between the legs of the circle of players. But the living pen whirls round and round ; and it is long before the jaguar succeeds in grasping the acoorie and dragging it out.

A flock of vicissi duck resting on the ground in a close-packed, irregular-shaped group, is well imitated in another game. The leading duck, at some supposed sign of danger, starts the whole flock, which now darts backward and forward in straight duck-like flights in among the houses, all the players imitating the curious characteristic whistling of the vicissi.

Again, one player only remaining detached, a procession forms and moves. The single player, continually moving too, ever faces the leader of the file, until, with the cry of a hawk, he runs down one side of the file to seize the hindmost of its members, each one of whom, as though startled by the sudden cry, crouches

down behind his front man, as a chicken behind its mother, and only the hindmost man runs up the line, on the opposite side to the hawk. If he is quick enough to effect this uncaught, he is safe for that time; otherwise he is carried off and placed among the onlookers. And this is continued until the whole brood of chickens has been captured by the hawk.

Or, all but one of the players squat on the ground, each behind his neighbour and clasping his neighbour's neck with his arm, and all forming a long line. The one man left out, representing an ant-eater, creeps up to the foremost man and, after scratching on the ground with his hands, seizes the foremost player by his feet, throws him over his shoulders and so conveys him, head downward, across the playing ground and places him among the spectators. This is no easy task when it is a well-grown boy who is carried off; and even when small boys are carried strength is displayed by carrying off two of the victims at a time. It is an ant-eater supplying himself with ants.

Again, one boy squats in the centre of the playing ground while all the others dance round him in wild disorder and confusion, buzzing like a swarm of wasps, and each one occasionally darting forward and rumpling the hair of the sitter or otherwise worrying him. Meanwhile the single player bears this in patience and without notice until he sees his chance, when, with the eagerness of a man who sees and uses his opportunity of catching and slaying a wasp which has long worried him, he seizes and disposes of each one of his tormentors. And in this way the doings of many other animals are represented.

Again, some children's games are simply exhibitions

of animal spirits without any dramatic element. For example, all but one join hands and dance round in a large circle within which stands the one player omitted from the ring. This solitary player dashes hither and thither, throwing himself against the enclosing wall, till at last he finds a weak point and breaks out.

And yet another, of a simple kind, consists merely in forming a procession, each man tightly clasping the waist of the man in front of him, which procession moves forward with the usual rhythmic stamp and song until suddenly and without notice some of the hindermost begin to pull back, so that the foremost are either pulled backward, without moving the soles of their feet from the ground, or show their ability to hold their ground. Or, in another variety of this amusement, the leader of the procession moves suddenly and without warning backward, trying to upset the hindermost.

Though the games as yet described are played generally by children, I have seen the young men join most heartily in every one of them. And among the Arawaks grown men and women, as well as children, play somewhat similar and equally simple games of imitation. The trumpet-bird or warracaba game is simplicity itself; and yet no one who knows the habits of the trumpet-bird* could fail to recognize what is being imitated. The players in single file, each with his or her hands on the shoulders of the player next in front, march and hop round and about the settlement, entering and prying everywhere, emerging from the most unexpected directions, always imitating the curious booming note of the warracaba.

* *Psophia crepitans*.

A monkey dance, too, I have seen adult Arawaks delightedly perform. It was distinguished among their games by unusually rough fun, and certainly seemed exciting. The players formed in line as in the warra-caba dance. And then the file, thus formed, simply rushed everywhere, sometimes over the roofs of the houses, tearing off bits of thatch and pretending to chew them, often up and along the rafters of the house, tearing and throwing down all the many small properties which the Indians there store, into the kitchen, upsetting the pot, devouring or destroying all food that came in the way, driving out the women who were baking bread, scattering the fire; and all the while chattering and grinning as vehemently as any troop of real monkeys. The women who were not playing scuttled at the very sight of the coming troop. The old man of the settlement and his wife, in real anxiety for their goods, tried to protect what they could, tearing it even out of the monkeys' hands, or throwing food to the monkeys to distract their attention from more valuable properties. At last the old man, with the help of one or two bystanders, secured the more violent of the players, and, despite some too genuine scratchings and bitings, managed to tie them up with ropes to the posts of houses. At last five had been so caught and tied in one house; and then, if there had been uproar before, there was pandemonium now. The captives screamed and shrieked and yelled; they rolled as far as their cords would allow, and tore with their teeth everything that came in their way: food, clothes, hammocks, pans, and calabashes. It was with difficulty I preserved a young chicken which one monkey had seized; and my camera, which unfor-

tunately was standing by, had to be most closely guarded. One monkey I even saw taking in, and spitting out, mouthfuls of salt and then of red peppers (*Capsicums*). At last, everything within reach having been either destroyed or removed, the captives took to fighting each other, in one heaving heap of humanity. And the whole mighty uproar only ceased when all were literally too tired to do more. Then rest and refreshment, in the shape of paiwarie, followed—and the usual good humour reigned everywhere.

The whipping game, called macquari, of the Arawaks is a very curious performance, to the most essential feature of which, the mutual whipping, I know of no exact parallel from among any other people. If, as seems probable, the origin of the game is due to a natural instinct of primitive man tending to the cultivation and exhibition of a habit of endurance of physical pain, analogies may be drawn between this game and all of the many habits of self-torture practised, and most stoically endured, by almost all people below a certain stage of civilization. A glance at a picture in Vol. I., p. 169, of "CATLIN'S North American Indians"—which picture, I may warn those of weak nerves, is of rather a blood-curdling nature—will suffice to give an idea of the extent to which this habit of self-torture has, among certain people, been carried. But I am not aware that elsewhere than among the Arawaks this habit has taken the particular form of extremely severe mutual whipping carried on simultaneously with extreme jollification.

Before describing the game, I must allude to the fact that both BRETT and SCHOMBURGK write of it as in some sort a funeral rite, as only practised in celebration,

or in commemoration, of some important dead Arawak. I have never been able to gain confirmation of this statement.* It is true that the game is very rarely practised now; and that there are but very few Arawaks alive who have retained by tradition the correct form and ritual of the ceremony. It is also true that in SCHOMBURGK'S time, and even in BRETT'S time (which, be it remembered, so far as his intimate relations with Indians are concerned, came to an end more than thirty years ago) the game must have been much more frequently practised. Their chance of obtaining information was therefore better than any that can now be had. But if the game really was a funeral rite it seems to me strange that within one generation all knowledge of this has died out from the minds of the Arawaks. Furthermore, there is a circumstance connected with the game which may easily have misled the earlier writers. A grave *is* prepared before the game begins; and in this grave, at the conclusion of the game, a burial *does* take place, attended by all the players. But the thing buried is not a corpse, but is the apparatus of the game, the whips and whistles which have been used and which are then ceremoniously buried, to be dug up and used—all that is left of them, with the addition of whatever new material may be requisite—when the game is again to be played.

As in almost all the other games of the Indians of Guiana, the macquari is carried on with much drinking of paiwarie, and has, at least in these latter days,

* The late Rev. C. D. Dance, in his valuable if somewhat ill-arranged "Chapters from a Guianese Log-book," attributes a funeral purpose to the macquari game, though without giving any important evidence of the fact. In a later part of these notes I shall make opportunity to use further this and other notes on games by Mr. Dance.

developed into a regular *paiwarie* orgie. Probably it was always so. The headman of the place where the *macquari* is to be held sends out, long before the day appointed, his invitations, each guest being given a knotted string or a notched stick, the knots or the notches on which represent the number of days before the game. The time appointed is, as indeed in all their games and dances, when the moon will be full; for the proceedings are carried on steadily through day and night.

As regards the instruments to be used, I think, but am not quite sure, that the hosts always make and supply these. Possibly, however, the guests make and bring their own share.

Of chief importance are the whips. The essential parts of each of these consist of the handle, which is a stout stick, some 20 inches long and perhaps 1½ inch in diameter, and the lash from 2 to 2½ feet long, which is made of a bundle of parallel strands of the remarkably tough fibres of the silk-grass, round which is very tightly and closely bound more, this time heavily bees-waxed, silk-grass: the whole forming as severe a cutting implement as any single lash could. But over these essential parts of the whip is put a thin covering, by way of ornament, of the far weaker uncleansed fibre (*tibisiri*) of the *æta* palm (*Mauritia flexuosa*); and this latter is extended and allowed to hang loose so as to make a sort of ornamental tassel at either end of the handle. At intervals of about an inch, all along the lash, the *tibisiri* fibre is bound tightly in with short lengths of bees-waxed silk-grass, thus adding, as it were, to the already severe lash the additional severity of a number of knots. Finally, by way of

ornament, the loose tassels of the tibisiri fibre are stained red, and a touch or two of other colour is sometimes added by tying on a few bright feathers.

In the above description the essential parts of the whip have been carefully distinguished from the ornamental. It will easily be understood, remembering the nature of the materials used for these two parts, that the former, the handle and the lash, are of a very tough and enduring nature, while the mere ornamental parts are of very perishable nature. When, therefore, after the game is for the time over, the whips—or some of them, for I think only a few are ever so treated—are buried, the ornamental parts must quickly decay, while the handle and lash endure. It is these latter which are dug up on the occasion of the next playing of the game and are then, under the name of "macquari grandfathers" (*Macquareetchi*), placed (I am not sure that they are actually used on this second occasion) among the whips to be then used.

It is as though the vitality of the sport were preserved from occasion to occasion; as if the macquari of one generation, reduced we might almost say to skin and bone, looked on, as a grandfather might, at the play of the macquaries of the next generation—surely a curious and characteristic idea, and one which may obviously have given rise to the idea that the game has the nature of a funeral rite.

Two wooden whistles are made, about three inches long, roughly carved and painted to resemble plovers—whistling birds be it remembered. These are, I think, used by the two chief male players. More of these instruments may sometimes be made and used, but I know of no case.

Whips and whistles are essential implements to the macquari game. Whether the other instruments which I have now to describe are also essential, or whether they really belong to some other game, perhaps more than one, which has in some way, now-a-days, got mixed up with the macquari, I know not. But I have seen the following all used.

The honorè—named from the Arawak name for the heron (*Ardea cocoi*)—is also a rough, very rough, wooden representation of a bird. It is used always by the women, and sometimes by the men, in place of the macquari whip—the blow given with it being of course merely formal and not severe.*

A large bundle of æta fibre is tied up to imitate the shape, in natural size, of a sloth. The two front limbs of this creature are tied together at the toes, in such a way that when the loop thus made is slipped over the neck of one of the players it hangs down his back like a sloth hanging by its front legs round his neck. The idea which underlies this is obscure to me, unless, as seems possible, it attributes a sort of badge of disgrace to any player who may in some way be a defaulter in the game.

Rattles, or shak-shaks, made of small round gourds, enclosing some pebbles, are mounted at the end of very long sticks (8 or 9 feet) and are adorned with tassels of æta fibre. One of these is provided for each female player.

* Mr. Dance, in his Guianese Log-book already quoted, page 273, alludes to the "Honora—the crane or heron dance" as distinct from the macquari. He may be right; and, in that case, it must be understood that the honorè element which I saw in the macquari was only accidentally mixed up with the true ritual of the latter game.

For most of the other games observed, special clothing, scanty but appropriate, is provided. For the macquari I have noticed only one such preparation, which is that the women cover their heads with small pieces of white natural cotton fibre. But as the Arawaks are by far the most civilized of our tribes, and have, with very few exceptions, almost invariably adopted shirt, trousers, and, in the case of the women, ordinary dresses, we may suppose that the tradition of the appropriate dress for the macquari has been lost.

When, in addition to the things already mentioned, a sufficient quantity of paiwarie has been prepared, all is ready for the game, which will last for a day and night or more, according as the paiwarie lasts out.

The guests arrive the afternoon before the first day of the regular dance. As they arrive they are met at the waterside by the hosts, provided with whips. The guests stand to be whipped, and, in turn, the whips being handed over to them for that purpose, whip their hosts. So, whipping and being whipped in turn all the way, the procession moves up to the houses.*

Before daylight the next morning the women are astir, and hand to each player a small calabash of paiwarie which has been especially prepared twenty-one days beforehand. Now paiwarie is undrinkable the first two days after it is made: is in perfection on the third; and rapidly deteriorates after. As a rule no one would think of drinking paiwarie more than four days old. But on

* I remember overhearing in a discussion as to which of two settlements should be the scene of an intended macquari dance, an argument put forward that one of the two was much more suitable as being furthest from the waterside and therefore allowing more scope for their initial whipping.

this occasion each player takes a dose of thoroughly spoiled paiwarie and—it is perhaps hardly necessary to throw light on what goes on under cover of the darkness that morning, but before dawn each player feels within himself a void which only a great quantity of fresh paiwarie can fill.

Soon after play begins. At first chiefly the men take part in it—though after a time some of the women occasionally break into the line and take part. At first too the proceedings are more like that of an ordinary paiwarie dance, the players standing opposite to each other in two lines, their arms round each other's necks or waists, and these two lines approach and retreat from each other with much rhythmic stamping. Suddenly this play is abandoned and the real business of the macquari begins. This may be said to take chiefly two forms, alternating, in the first of which only the men take part, while the women share in the second.

In the former, in which the really serious business takes place, two lines of men and boys stand facing each other, each provided with a whip, and the two at one end having the two whistles. The members of the opposite rank stamp rhythmically at each other, all keeping up a constant shouting of *Yau-au* (like *au* in German *Frau*), all waving their whips. Suddenly the two with the whistles pass down from their end, between the lines, to the opposite end, the two lines meanwhile moving up in an opposite direction. More stamping follows; and then the two whistlers begin excitedly whistling at each other. This is done with the most comical vehemence, the two holding their heads in opposite directions to each other while whistling, and each of

these at regular intervals reversing the direction in which his head is held. Then takes place for the first of many times what I may call a complimentary whipping. Each man raises his whip high over his head and brings it down with a great show of force and violence, as though bent on cutting open the calf of the opposite player's leg; as a matter of fact, however, the stroke ends in the merest, gentlest, flick of the leg. After that the whistlers rush back, as they came, to their original positions at the other end of the line. These proceedings are repeated several times, till at last the lines break up, and the women at once bring round to each player calabashes of paiwarie. But it is also now that the serious business of the thing begins, any pair, or any pairs of the players, challenging each other to a real use of the whip.

The two challengers stand apart. One puts forward his leg, planting it firmly; generally he turns his back and consequently his calf towards his opponent, but sometimes faces him exposing his shin. The opposite man stoops and stretches out his whip so as carefully to measure the distance to which the lash will reach; then, rising, he carefully poises it over his head—and flogs, one single stroke, but with all his might and main. The crack is like a loud pistol shot. The first time I saw and heard the blow given, seeing not the slightest flinching of the recipient's body, not a twitching of his lips, I was fully persuaded that there was some trick in the thing, that the blow was little or nothing else than mere sound and fury. Expressing something of this, the flogged man turned toward me his calf, and right across it, extending nearly round on to the shin, was a bleeding

gash. The stroke having been given the two players at once began to dance against each other for a few seconds, the flogged man during this shouting out *au*, the flogger *yau*. Then the same man receives a second stroke, which is sometimes, apparently according to a rapidly made sign, a second serious stroke like the first, sometimes a merely complimentary stroke. Then follows another few seconds of dancing and shouting. Then the one who flogged before is now flogged in the same way, either only the first or both strokes being serious according as were those he had inflicted. Then the two return to the body of players, in the best of humours, hang up their whips, go to the *paiwarie* trough and drink together.

The whole business, the two lines of dancers, the pairs of challengers, and the flogging, are repeated again and again throughout the day and night; and, if the *paiwarie* lasts out, throughout the next day and the next night, and sometimes, I am told, yet longer. From time to time all the players, men and boys alike, give and take their share of blows, some, however, being more eager than others for this part of the entertainment; in proportion, as it seemed to me, to the skill which each attributed to himself in scientifically and forcibly inflicting the cuts. Watching with the greatest care, I have never detected the slightest flinching or sign of dread of the blow, nor any sign of ruffled temper. Yet I have seen men, and even small boys, after twelve hours of this work, with their calves so cut about, that they could not put their feet to the ground without pain; and in the case of one boy, whom I took into my service immediately after one of these performances,

the scars lasted for many months. I may add that the two challengers are in all cases suitably matched, boys challenging boys, and men challenging opponents worthy of their lash.

But the performance so far described is occasionally slightly varied, and it is in this second form that the women take part. It seems a milder, perhaps a later, form of the genuine whip game; and it seems itself to admit of a good deal of variation. The women who take part in it are armed, not with whips, but each either with the long shak-shak or rattle, which has already been described, or with the wooden figure of a heron. The leader of the men also has one of these wooden birds in place of his more usual whip. Two lines are formed, the men and women standing indiscriminately, facing each other. These two lines make the usual series of advances and retreats to and from each other, those players who have whips shaking these, those who have rattles shaking these, by hitting the stick part of them at regular intervals with their disengaged hands; and those who have honorès shake these at each other. Then a pause is called, the players, men and women alike, put forward their calves and each receives, either with whip or honorè, a quite gentle tap, a complimentary stroke as I have called it elsewhere. Sometimes too, the players, instead of dancing opposite to each other in two opposing lines within the house, vary the proceedings by marching round and round the house in double-filed procession, stopping from time to time to give and take the complimentary strokes. Then follows the usual paiwarie drinking.

A curious dance in which the macquari whips are also

used, indeed it is perhaps but a figure of the genuine macquari dance, is as follows. On the ground in the centre of the dancing place lies a flat square board, of perhaps two feet square. Two old women, or an old man and a woman, rarely two young persons, squat opposite to each other with this board between them. Each is provided with a rough wooden figure of a man, called *warrau*, which word as thus used by the Arawaks signifies "barbarian," *i.e.*, a person not an Arawak, or sometimes in place of this *warrau* each has a bundle of a few straight sticks from two to three feet long. Whichever instrument is used, it is beaten by each player on the board to a sort of rough tune and with an accompaniment of rhythmic chanting.* The words of this chant, as I am assured, are now unintelligible nonsense; frequent reference is, however, evidently made to the *ourana*, or labba. In a circle outside these beaters of time stand a few, apparently rarely more than four or six, of the young men. Each of these is provided with his macquari whip, which he holds by its two extreme ends, his arms being thus outstretched to their full span. The extreme end of the lash, held in the left hand, is pointed toward the centre of the circle and is held so as almost to touch the ground; the opposite end, held in the right hand, is held as high as may be from the ground. Thus the bodies of the circle of dancers are all inclined inward, the lashes of

* In *Nature*, for September 5th, 1889, it is stated that the Mincopies have but one musical instrument, which consists "merely of a hard-wood board, of special shape, which is used for sounding a rhythmical time for dancing. It is used only as a musical instrument, and so illustrates a step in advance of the Australian, who taps with a stick upon his 'casting board' for the same purpose, without employing a separate instrument."

their whips pointing to a common centre, at which lies the square board. Suddenly, at a signal from the time-beaters in the centre, and always in time with this beating, the men come forward with a curious little running motion, and the circle contracts. The time-beaters beat on, now faster, now slower; and as they beat, the circle of dancers round them advance and retreat, faster or slower; and, as they dance, in constant alternation the points of the whips are now raised toward the sky, so that the men's figures are bent backward out of the circle, now are turned, as at first described, down toward the ground. Description entirely fails to give any idea of the curious gracefulness of this measured swaying backward and forward of bodies, and of the unusual grace and unusual activity of these dancers.

After a time the women occasionally break in and increase the circle of dancers, to the destruction both of the gracefulness and, it must be said, rapidity of the dance.

The Warrau game, called *taratoo*, in which the most marked feature is that each player is provided with a large shield made of palm-leaf stalks, is both, as far as I know, unrecorded as played by any other people, and is remarkable for certain features peculiar to it. Chief of these are, that it is the only game, except mere children's games, known to me which is not accompanied by drinking, and that there is a real element of contention in it, in that it is used as a practical means, a trial by ordeal, of settling disputes which may have arisen between distinct groups of Warraus, generally between two groups, respectively occupying adjacent rivers or creeks.

The absence of drinking may, perhaps, be explained in this way. The usual fermented liquor used in the Indian games of Guiana is either paiwarie or casiri, both of which are the ordinary everyday drink, one might almost say meat and drink, of all the Indians of Guiana except the Warraus. The latter—of course I speak of them now in their natural state, in which they are now only found, in British Guiana, near the mouths of the Barima and Amakooroo rivers—have never risen to the level, if I may so speak, of a good drink; they live, apparently, curiously uncomfortable lives, hidden away between the mud and the gloom, in dense æta palm swamps at the edge of the sea. The ground there is nowhere dry enough for the growth of cassava; agriculture, even in the simple form practised by the other tribes, is unattempted and is indeed impossible; and consequently the great food-supply which the other tribes use, in the form of cassava bread and paiwarie, is unattainable and unused by the Warraus. They seem indeed, in their purely natural state, which is perhaps no longer exhibited anywhere, unless on some of the more remote and intricate windings of the mouths of the Orinoco, to have been in little more enviable a state than the Digger Indians of California or the Fuegians, generally accounted the most miserable of human beings. Even game is very scarce in the sea adjacent swamps where live the Warraus, who use instead fish and crabs. But one food supply they have, of a marvellously all-sufficient, if unsatisfactory, character, the æta palm (*Mauritia flexuosa*); and on this, if we except the fish and crabs, they live exclusively. The pith of the æta palm and the pulp round the fruits of the same tree serve them as

bread-stuff ; the fermented sap of the æta palm alone seems to save them from quite always quenching their thirst with water. For some reason, possibly with a natural and wise instinct for the preservation of the palms, which are so much to them, they only sparingly use this liquor—the drawing of which means the destruction of the natural cask, that is the death of the tree. Unlike the other Indians, the Warraus, therefore, are not naturally habituated to the incessant use of fermented liquor ; and for this reason it is perhaps that, also unlike the other Indians, they do not use it at their national game.

It is a curious fact, of which I make a present to the teetotalers—though I do not think it would be safe for them to theorize too much about it—that the energy, emulation, and excitement shown by the Warraus in their liquorless game, is at least equal to that shown by the paiwarie-filled game-players of other tribes.

The second remarkable feature of the shield-game is that it serves as a trial by ordeal. The Warraus of one river are accused, say, by the Warraus of a neighbouring river, of having stolen some pots, or some other such offence. The dispute between the two parties waxes hot. But instead of an interchange of blows, the headmen of the two parties meet ; and these two arrange that their followers shall assemble at some appointed place, and at a date sufficiently far ahead to allow of due preparation, and shall then fight it out—or play it out. A tree is chosen ; and on one and the other side of this tree each of the two captains respectively make a number of marks indicating the number of days before the strife. They make the tree look—as one civilized Warrau once picturesquely described to me—like a newspaper. The

two parties now return each to their own homes, and there occupy themselves until the day of strife in the preparation of their shields and of as much in the way of body ornaments as the simple means at their disposal allows. After the strife, it may be as well here to say, the vanquished will, in the case above supposed, good-temperedly pay to the victors the amount of the damage which by ordeal they have been shown to have done.

The shields, one of which each man and each boy prepares for himself, are made in this way. One stands before me as I write. Three sticks of light wood, the centre one much slighter, but also nearly double the length of the other two, are laid at distances of about 15 inches parallel to each other on the ground. The two outer sticks are perhaps 4 feet long, the middle one 7 or even 8 feet. Across the front of these parallel sticks, pieces of the leaf-stems of the æta palm, all cut to one length, perhaps 30 inches, are laid parallel to each other and close together. These are then tightly bound with the fibre from the æta leaf in the place which they now occupy. The result is a compact, dense shield of æta stalks, square or oblong in shape, above the top of which the two outer of the three upright sticks project 5 or 6 inches, while the centre of these sticks projects several feet. To give additional strength to the shield a stick of light strong wood is bound across the top of the æta stalks, crossing the three projecting sticks at right angles; and another stick, this time a stout piece of palm leaf-stalk is bound on similarly at the bottom of the shield. Into three holes made in this lowest horizontal stick the lower ends of the three upright projecting sticks are inserted. Great tassels of flowing æta fibre, partly dyed red, are

now bound, by way of ornament, on to the three sticks which project over the top of the shield ; and the outer face of the shield, also by way of ornament, is painted in quaint barbaric patterns with certain white, red, and yellow ochreous earths. The shield is now complete. It should be added, however, that each maker prepares his shield of a size suitable for himself, so that these vary in size from that of the big full-sized man to those of the small boys.

The personal adornment is of a very simple nature, its constituents, if we exclude the few beads or teeth which a very few of the Warraus are rich enough to have and to habitually wear, are only æta fibre and coloured earths. Yet it is a fact, easily paralleled among other Redmen, that a great variety of taste, and some very good taste, is individually shown. Among the group of players all individuals may be discovered varying from the sloven's state to that of the well and worthily dressed man—I had almost said gentleman. Yet the latter has nothing over his bright clean skin but a loin-cloth or lap a few inches wide, a few bunches and twisted strands of straw-coloured palm fibre—these latter sometimes partly dyed to a pretty and congruous red colour—and possibly a few patches of coloured earths, and sometimes of plant juices.

Here is the description of one special player, in a sense as well and as becomingly dressed a man as I ever saw. His waist-cloth was of clean white calico, and was the only European thing about him. It was kept in place by a thick girdle of loosely twisted palm fibres. Round each of his legs, just below the knees, and round his arms, just above the elbows, were similar girdles, each

ending in a long and flowing loose end. From round his neck to below his waist hung a thick sort of cloak of entirely loose fibres; and round his head was a fibre fillet ending at the back in a branch of long loose ends, which hung down over his neck. The whole of his hands to above the wrists, and the whole of his feet to above the ankles, were dyed of that deep Indian red colour (procured from *Bixa orellana*) which is, strangely enough, so becoming to the red skin of a Redman. The whole of his clothing, except the paint, I can hold in one small bundle in my hand; yet in this full dress he looked only not a dandy because perfectly becomingly dressed.

When the appointed day comes and the players are gathered together, each with his quaint shield and many flowing tassels, the group presents, as a whole, as picturesque an appearance as can well be imagined, the almost solely prevalent colours of which are soft and well blended reds, yellows, and browns.

After all this preparation the game is simplicity itself. Each party is drawn up in a long single line, the two lines facing each other in such a way that each player has immediately facing him a player of the opposite side of about his own size. There is much stamping of feet, and much shaking of shields, now held high over head, at each other; and there is much shouting of the word *saki, saki, saki*, each series of shouts ending in a general roar. Then suddenly the two lines take a half turn, and march off and about in single file, but the two sides, side by side, the stamping, the shield-shaking and the shouting being still kept up. Those who, judging by the unfortunate stray Redmen seen dazed in Georgetown, think these people

naturally dejected and low spirited, would quite change their opinion did they see the same Redmen wildly excited and in the highest of spirits during this game. Suddenly the marching ceases, and the two parties resume their places opposite to each other. Each man gets his shield against that of his opposite foe. Then, now in silence, the two push against each other, each striving might and main, heart and soul, to push his opponent back from the line and if possible to overthrow him. Then follows more marching ; and the whole thing is repeated time after time till all are too weary to do more. Then the thing ends. It would often be difficult for any but the most observant onlooker to tell which side had got the better—but they themselves know, and the vanquished admits their defeat. Forfeit is paid, or arrangement is made to pay the forfeit at some convenient time. Lastly, all separate in the best of tempers.

An account, written at the time, of a very curious ceremonial feast which I saw held, apparently with strictest and most accurate ceremony, by the Partamonas, a branch of the Ackawoi tribe, at their village of Araiwaparoo in the neighbourhood of the Ireng river, must bring this paper to a close. In the course of an overland journey in the interior of this colony, I, with four of my Pomeroon Indians and a large crowd of Macoosi carriers, arrived at Araiwaparoo before noon on Sunday the 19th of February, 1888, and there found great preparations in hand for a dance that afternoon. We were earnestly invited to stay for it, and as this would make no difference in the number of days which it would take us to reach our journey's end, I consented. A dance called parasheera, seems to be practised especially by the

Macoosi and Ackawoi; possibly by all the other Carib tribes too. There are but few Ackawois on my own river, the Pomeroon, and those few are comparatively recent arrivals; but one of the Pomeroon Indians who was with me assured me that he had seen the dance among the Ackawois on that river many years ago. The other Pomeroon Indians all assert that neither the Caribs nor any of the other Indians there know it.

Parasheera seems to be the name not only of the dance but also of each of the performers who, fantastically clothed, arrive at the appointed settlement and institute the dance. Even when we reached Araiwaparoo in the morning, the wooded heights round us from time to time re-echoed to frequent shouts; these, however, for some hours died away each time they were raised, without anything apparently happening or any one appearing. There seemed a good deal of hesitation and unwillingness in answering my questions about these shouts, and an air of mystery seemed to pervade the whole village. I, however, induced one of my Macoosi travelling companions to throw some light on the matter. He told me that it was the parasheera gathering. Each party of two or three of them, being the male inhabitants of one household from some part of the neighbouring savannah, as they come, shouting and yelling, to some spot in the forest, appointed as a gathering place, near the village where the feast is to be held, hush their cries and wait till the other parasheeras, each party of whom seems to come from a separate, more or less distant settlement, come up. Only when the representatives from all the invited settlements have thus gathered together at the appointed place in the forest near, but not in

sight of, the place of the feast, does the whole party move forward together to the feast. When we arrived at Araiwaparoo, and for some hours afterwards, the mysterious parasheeéra were thus gathering, unseen but most certainly heard, and apparently not to be talked of, in our neighbourhood. I confess to have myself gradually felt eager and ever increasing excitement; but this feeling was obviously developed to a much greater degree in the Indians of the settlement and in my own Indian followers.

At last, just before four o'clock, the excitement reached its highest pitch, and seemed to pass into a new phase. The men and boys of the settlement rushed into retirement in one of the houses; whence they presently issued fantastically painted with the finest white clay. The headman had a broad band of this pigment entirely across his face so as to cover both eyes, and meet the ears on either side; he looked exactly as though blindfolded with a white handkerchief. The same man had also various bands of the same white substance round his body and legs. Each of his party was also painted, each differently, with this same substance. Otherwise they had no ornament, and no clothing beyond the ordinary narrow band of dark blue cloth passed between their legs and falling, apron-like, in front and behind. Each had a whistle formed of one, two, or three very slender pieces of bamboo, arranged, when there was more than one of these, like pan-pipes. This instrument is called *kimiti*, and from this instrument the whole of the party is also called *kimiti*. Those who amuse themselves with far-fetched fancied points of analogy between different languages may be especially interested

to hear that this *kimiti* performed exactly the office of a reception committee. Some of the *kimiti* carried in their hands, and frantically waved, small joints of smoke-dried meat. Then, with endless frantic and most fantastic caperings and posturings, and with the most vehement sounding of their shrill whistles, the *kimiti* darted like a flock of wild duck down the path toward the forest, whence the parasheera were expected to emerge. The nearer and nearer approach of the expected guests was indicated by constant increase in the loudness of the most extraordinary and pandemonic roar which they raised—which, by the way, contrasted curiously, and, doubtless intentionally, with the piercingly shrill sounds of the equally, but differently, noisy *kimiti*. At last, just as the two bodies of different noises approached and blended in a most truly marvellous inharmonious harmony, the first of the long single-filed procession of new-comers came in sight, just at the edge of the forest. His entire body was concealed in a clothing of the pale yellow-green young leaves of the æta palm (*Mauritia flexuosa*). A skirt of the same, plaited together at the top, but otherwise hanging loose, hung from round his waist to his heels. A similar cloak of the same hung from round his neck so as to overlap the skirt; and a curiously plaited arrangement of the same leaves encircled his head, part serving as a far-extending, halo-like crown, part hanging down visor-like, over his face so as to overlap the top of the cloak. He held in his hand a long wand of trumpet-wood (*Cecropia peltata*), pierced with holes so as to serve as a rude trumpet, and surmounted by a large flat representation of the sun or moon, or some star, or of some animal or bird, made of carved and painted soft wood.

As the procession emerged from the bush it was seen to be composed of thirty-five of these fantastically dressed figures (*Parasheera*), each dressed exactly as above described except that in each case the figure which surmounted the trumpet-wood dancing-stick represented some different object of the heaven or of the earth; or in some few cases was replaced by a long rattling band of rattle seeds (*Thevetia nerrifolia*). Almost all the performers were grown men, but the last half dozen or so were boys of various sizes down to the smallest. The first three men were accompanied by their wives, who were, however, not in the rank, but walked, or rather pranced, each by the side of her husband, her hand on his shoulder. These women were entirely without clothing or ornament except the usual small bead apron; and each had as solemn a face as if she were taking part in the gloomiest or most sacred of rites.

As the party of *parasheera* and the *kimiti* met, the former blew, though that had seemed impossible, more vehemently and more deeply through their deep-toned trumpets, the latter redoubled—nay, increased beyond the power of words to express—their ear-splitting whistling. All, of both parties, postured and capered, and stamped, and waved their sticks till the whole was welded into as strange a phenomenon of sight and sound as eye ever saw, ear ever heard, or mind ever conceived. The *parasheera* came on slowly but steadily; and as they did so the *kimiti* whirled round and round the advancing line, even while at the same time they were posturing and capering, and—as it were—turning on their own axis, as frantically as ever. Meantime I had wedged myself with my small hand camera against

the wall of the house in which the parasheera were to drink, in the hope of obtaining some instantaneous photographs. Whether by accident or design, the long procession closed around me, yelling, shrieking, and roaring, and waving their dancing sticks so closely round my head that I had continually to duck to avoid them. Then it passed on round the house; and just as I made a rush for my larger camera, which I had before stationed in position ready for another chance photograph, the procession, to my great disappointment, wended its way into the house, the head man—who had led the procession—alone remaining outside, and there formed a circle, faces inward, round the paiwarie trough. And now, as Mr. RIDER HAGGARD would write, a thing most surprising to me happened. The kimiti, with the exception of the leader, instead of going in to share the feast with the parasheera, retired quickly into their own house, washed off their clay adornments, and came out and set about their ordinary occupations. It was indeed remarkable that except as a sort of a reception committee the men of Araiwaparoo itself—the male hosts as it were—took almost no part in the feast.

The headman of the parasheera, who, as has been told, instead of entering the drinking house with the others remained without, now sat down outside the door and was there entertained, not for one hour or two, but until I left the place the next morning, by the leader of the kimiti, with pepper-pot and cassava, with much paiwarie, and with an endless interchange of every ejaculatory conversation.

Meanwhile I entered the house, whence the most fiendish noise was issuing. I found the whole party pos.

turing in the most curious way, going through what I can only describe as the most solemnly ridiculous and fantastic posturings, their bodies energetically, yet steadily, bent from the hips alternately backward and forward, while at the same time their stamping feet moved the whole circle of them round and round the paiwarie trough. All were chanting as loudly and sonorously as possible a short continuously repeated sentence, *erantan eworki*, which being interpreted by one of my own Macoosis was said to mean "that they had come to drink like hogs." This sentence, apparently more apposite of meaning than they intended, really signified that they, in the character of bush hogs (or peccaries) had come to drink. And to a very large extent they justified their statement that they had come to drink like hogs, both in its apparent and in its intended signification ; for while they certainly did, as a rabid total abstainer might say, drink like hogs, make beasts of themselves, they, at the same time, cleverly managed to keep up the whole time a somewhat close suggestion of a herd of peccaries. Their stamping was as the stamping of a herd of these animals ; and every now and then they interrupted the chanting of their sentence, first to utter a series of fiendish shrieks which were then always immediately followed by a rapid and vehement imitation of the gruntings of a herd of bush-hogs when disturbed by some unexpected sight or sound. But even the monotony of the chanted sentence was occasionally, perhaps once every half-hour, altered by the adoption of new words. Sometimes it was *erantan meopoi wai cy*—"we have come to a bad place;" that is to say they had had to mount a steep hill to reach the drinking place. This was followed by a suggestion

that, they having taken so much trouble, it was to be hoped that at least the drink was good and plentiful. Sometimes it was *ewoto wai e re kay*—"we mash the ground like bush-hogs;" and certainly they did stamp on the ground, "earth-shakers" they were, like but much more vehement than any bush-hogs. Then again, they were shouting in chorus that "hog want our dancing sticks, but we no let hog have them."

The three women who had come with the party of parasheera were not actually included in the circle of dancers; but they pranced round just outside this circle, each behind her husband, with her hand still on his shoulder.

The women of the settlement of Araiwaparoo had from the first kept within the drinking house, and were now inside the circle of dancers, where they were busily employed in handing calabashes of paiwarie or casiri to the thirsty dancers.

With almost no variation this went on all night. Every now and then two or three of the dancers retired from the circle and the house to free themselves by vomiting of the superfluity of liquor. And later on in the night a few occasionally fell down as they danced, only however to recover themselves in a marvellously short time and resume their places in the circle. The caperings of course got wilder, the shouts more disordered, and the dresses much disarranged. Two or three of the women of the place, one carrying her new born baby under her arm, took part in the procession for a few minutes. Sometimes, too, nature seemed to be going to have her way and the proceedings slackened; but whenever this happened the watchful kimiti rushed into their own

house, adorned themselves afresh each time with white paint and, entering the dancing house, frantically capered round outside the circle of the parasheera, rousing the latter by frantic whistlings and shouts to fresh exertions and fresh potations—and never in vain.

I left the place at seven the next morning, having some difficulty in inducing one or two of my own Macoosis to start; for my men, though they had not been allowed to take part in the dance—had indeed only been allowed by stealth to enter the dancing house—had yet been given, outside the house, a very fair share of the liquor. The proceedings were then still in full vigour, except that the headman of the parasheera and the leader of the kimiti no longer sat talking at the door, but lay there prostrate and overcome. I was assured by some of my own men that the proceedings would continue as long as the paiwarie lasted, which might be all that day and partly on into the next night; but that as soon as the liquor was finished the procession would move off, with as near the same ceremony as their state allowed, to the next settlement, and would there go through the same performance. I was fortunate in seeing them only at the first settlement, but the party was engaged to visit three others. In each case, I was told, the number of the parasheera would be swelled by the men and boys of each of the settlements at which they had already danced.

On the evening of their arrival I enticed several of the dancers out by presents of pipes and tobacco, but could hardly get them to stand to the camera, from which they always fled in terror. Of course, my night was sleepless, and was at first much disturbed by occa-

sional visits from one or two of the stray revellers ; but when these began to make themselves too unpleasant, by adopting vigorous measures and ejecting two of the revellers from my quarters more forcibly than politely, I established a sort of sacred circle round myself into which there was no further intrusion.

Through some not very obscure cause the house in which my men were spending the night caught fire, and was burned during the night ; and I had some little difficulty in rescuing my goods uninjured. Often on these savannahs one passes burned and abandoned houses ; and I never do so now without wondering whether they were destroyed on some such festival as that just described.

If time and opportunity permit, I propose to continue the subject of "Primitive Games" in a future number of *Timehri*.

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*Notes on some of the Scale Insects inimical to
Vegetation, found in the Botanical Gardens,
Georgetown, British Guiana.*

By S. F. McIntire, F.R.M.S.

ROM time to time since last autumn, Mr. ROBERT WARD, of the above Gardens, has sent me, by the instructions of G. S. JENMAN, Esq., F.L.S., the Superintendent, consignments of leaves of plants, shrubs, and trees, on which were scale insects and other vermin, with a view to my getting them identified by the leading entomologists in this country.

In this matter I was fortunate in obtaining the cordial co-operation of J. W. DOUGLAS, F.E.S., he being a most accomplished specialist in this branch of entomology; and another gentleman, Mr. ALBERT MORGAN, of Oporto, eagerly lent his valuable assistance from his stores of entomological erudition.

The results of their united researches, up to the present time, are briefly stated in the following notes.

The palm-scale, a pretty, though very destructive insect, was identified as *Cerataphis latanix*, an aphis, common on palms in all countries, and often very troublesome in hot-houses in England, upon orchids and other plants. It is well figured in Buckton's "British Aphides," Vol. IV., Plate 134. It is remarkable on account of the waxen fringe which surrounds its margin.

Another very remarkable insect was *Orthezia insignis* (Plate I., Fig. 1), upon some leaves and flowers of a plant belonging to the Compositæ. This insect first be-

came known to science in December, 1887. A paper by Mr. E. T. BROWNE, F.R.M.S., with beautiful illustrations by H. F. HAILES, F.R.M.S., will be found in the Journal of the Quekett Microscopical Club for that month.

Mr. DOUGLAS also described it in the "Entomological Monthly Magazine," and gave it the name which it bears. It had been noticed, as a stranger, among the plant-vermin of Kew Gardens, into which place, we now know, it must have been introduced upon some plant from British Guiana. It is a very beautiful creature owing to its waxen appendages, which, however, are easily broken; and all possessors of microscopes and collections of microscopic objects will desire to get it as a mounted slide when they have once seen it. The male, a tiny two-winged fly with two caudal filaments coated with white wax, was fortunately obtained, so that in this case, the blank, which exists in so many instances, is filled up.

Many specimens of a *Ceroplastes* (Plate I., fig. 3) have been found on ferns, but, up to now, Mr. DOUGLAS has not been able to identify them specifically. It may prove yet that they are new to science. The fact that this coccus has been found in abundance on ferns is a new one. *Ceroplastes* is a genus, mostly tropical, and there is only one species that is European (*C. rusci. Linn.*) It is found in the South of Europe. Although many species from several countries are known, they are known only in the female sex: no male has yet been found. The creature, female, is always enveloped in wax, except on the ventral surface. In its early stages the wax plates are six or eight in number, on the margin, but they gradually approach each other and ultimately unite.

One parcel of palm leaves yielded hosts of the curious coccid, *Ischnaspis filiformis* (Plate I., fig. 4), which also was observed on mango leaves. This was discovered for the first time some years ago by Mr. DOUGLAS upon several plants in the Gardens of the Royal Botanic Society, Regent's Park; and named by him as above, but these leaves from British Guiana gave us the information whence these hot-house pests had originally come.

On mango leaves and certain orchids was found the very beautiful coccid, *Vinsonia stellifera* (Plate I., fig. 2). This had only been seen previously by the entomologists, SIGNORET and WESTWOOD. The former had his specimens from Réunion, and the latter found his in plant stoves in Paris. The insect was regarded by both as the most remarkable member of the whole family. SIGNORET speaks of it as "cette magnifique espèce." In its immature condition it is like a little waxen star, but in the adult state it is like a tiny tent pegged down to the leaf at seven points. The mango leaves were tenanted by a variety of curious coccids. One, at least, proves to be new. It has recently been named by Mr. ERNEST GREEN, of Ceylon, where it is very prevalent, as *Lecanium mangiferæ* (Plate II., fig. 1). And another, after considerable difficulty, was identified as *Aspidiotus personatus* (Plate II., fig. 2) of Cornstock. This latter has more recently been found on the leaves of other plants besides the mango. I am told that several new species of *Aspidiotus* have been discovered by Mr. MORGAN, who will describe and name them in due course.

Cupania sapida yielded a variety of *Coccidæ*. Some

found on the stems and mid-ribs of the leaves proved to be *Lecanium testudo* (a large brown species) and *Planchnia fimbriata* (Plate II., fig. 3) of WESTWOOD. This latter is a most beautiful object, ornamented with spines all round the margin. Its identification taxed the abilities of both Mr. DOUGLAS and Mr. MORGAN to the utmost. I believe some new things were found on *Cupania sapida* besides these, but I await information on the point.

Diaspis cymbidii (Plate II., figs. 4 and 5) was found on mango leaves in great abundance, and both male and female scales were secured. This is a very fortunate find, for, as I said before, very few males of the *Coccidæ* are known to science.

It may be many months yet before the whole of the coccid mysteries received are wholly unravelled, for the subject is a very difficult one; but enough has been said to show what an interesting branch of inquiry has been opened up.

What a chance is here for the young microscopists of Demerara to distinguish themselves! The males of *Vinsonia stellifera*, *Ceroplastes*, *Ischnaspis filiformis*, *Lecanium mangiferæ*, and the rest, are wholly unknown to science; and the finding of any of these, and its correct representation by drawings, and mounted slides, sent home to Mr. DOUGLAS, the Secretary of the Entomological Society, would bring these aspirants for honour into note at once.

In order to help them I will state what is the history of a coccus, no matter what species. The adult female dies, and leaves beneath her a heap of eggs, duly hatching out into active larvæ, which run all over the plant

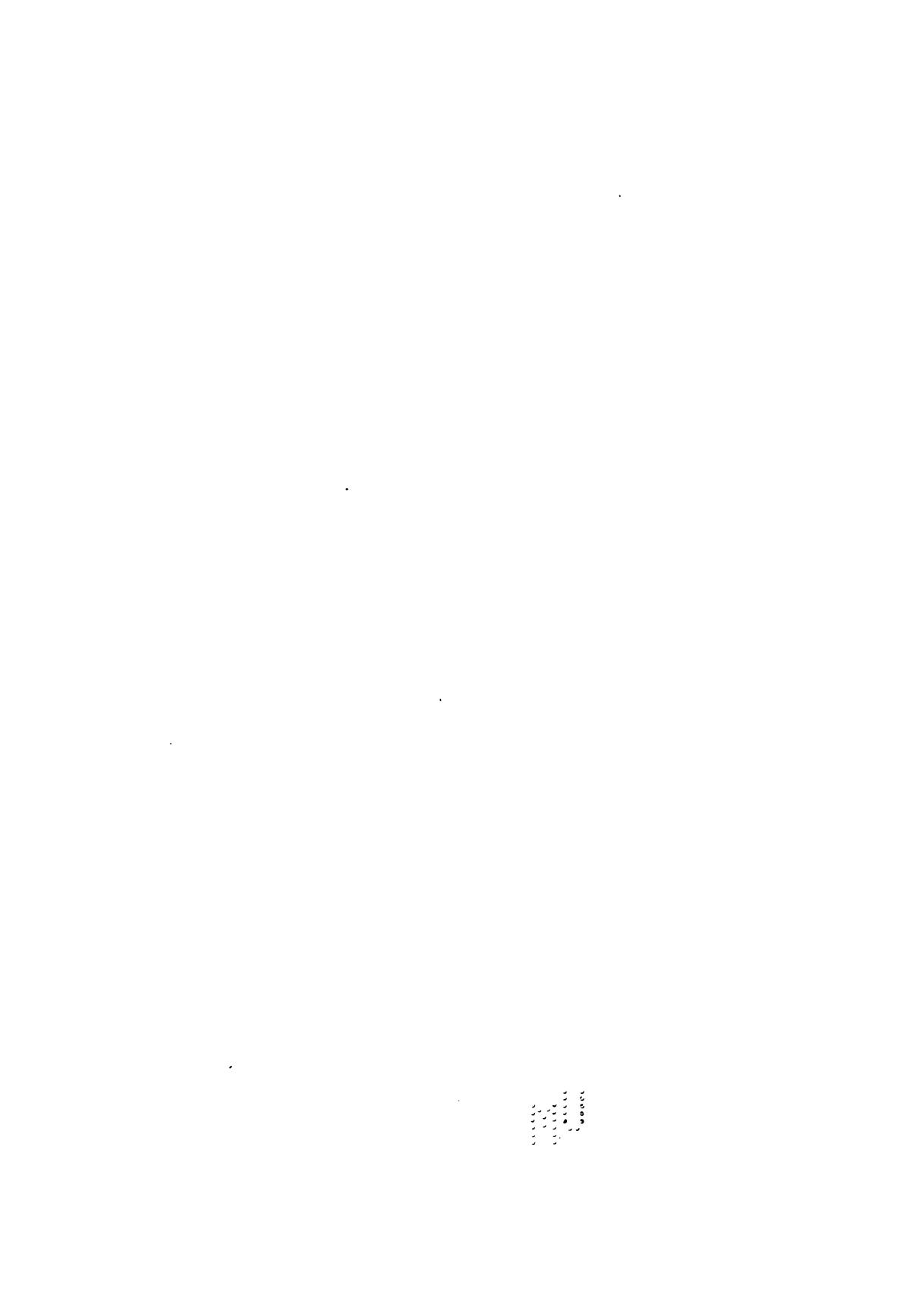
on which they feed. At first, both males and females are so nearly alike that the difference is microscopic. When they change their first skin, however, they become very different, as the scales of *Diaspis cymbidii*, which I have figured, show. Both males and females now become stationary. The females increase in size, but, except in this particular, do not change. The males, however, at the right time emerge from their masks as minute two-winged flies, which copulate with the females, and these then die, leaving under their dead bodies the fertilized eggs, and so, the record begins again.

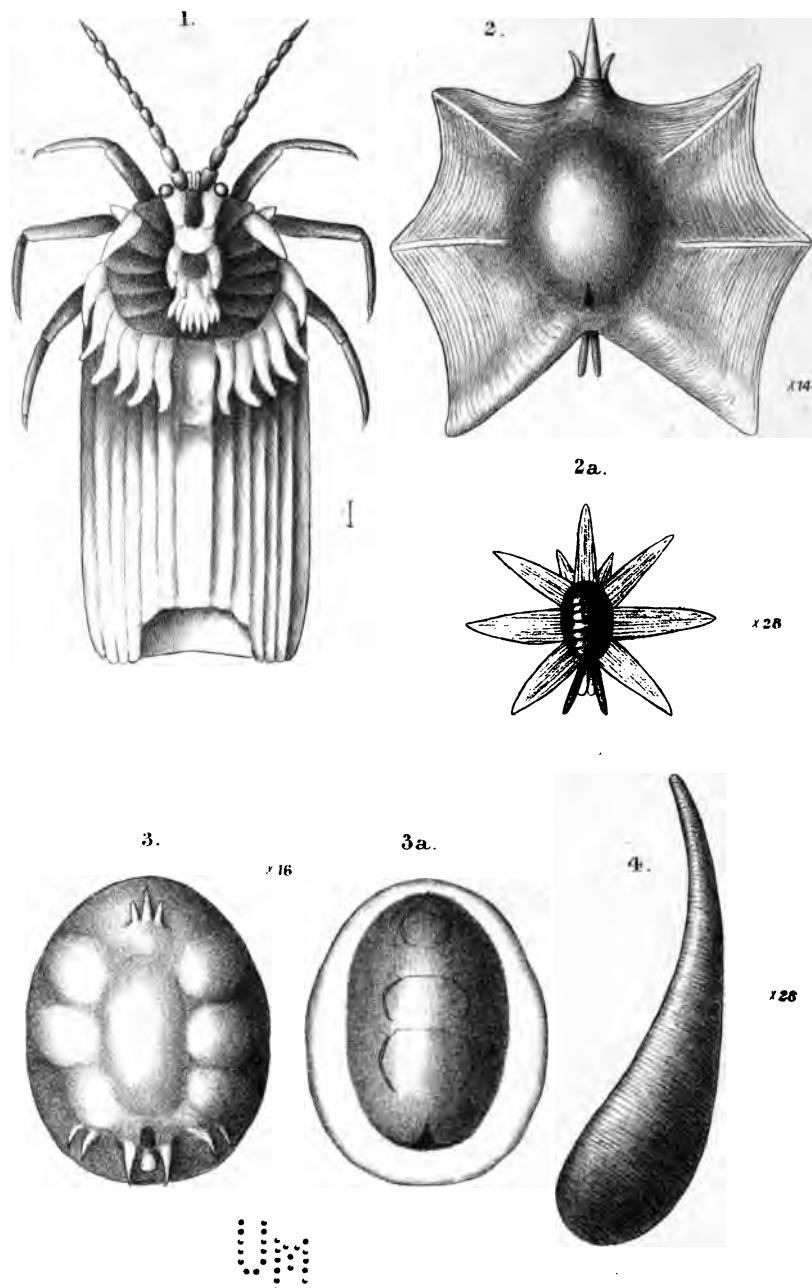
The above information may be found more at length in the "Entomological Monthly Magazine" since December, 1888, and the last two numbers of the "Journal of the Quckett Microscopic Club."

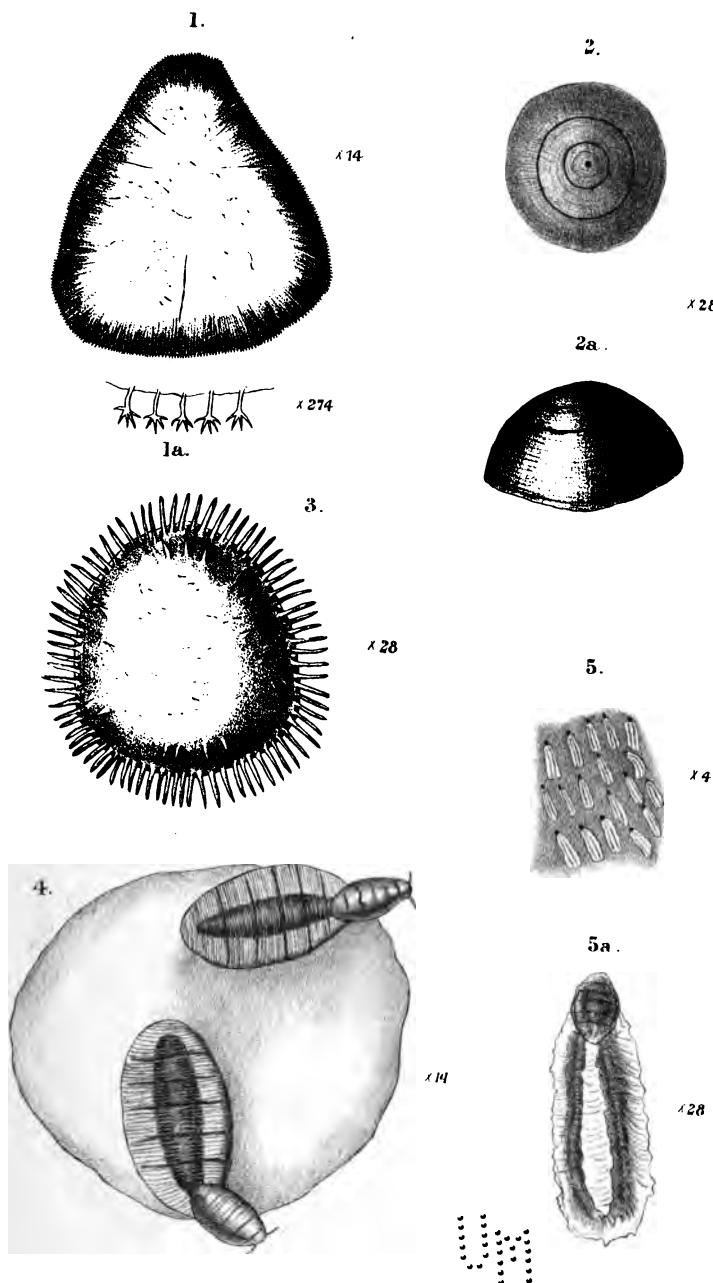
Note. Further consignments of fern leaves of various kinds with *Ceroplastes* upon them having arrived, Mr. Doherty has had better opportunities of examining this curious creature. He thinks, with some doubt however, that it is *C. vinsoni*, a species which is found in the Mauritius upon guava and Japanese medlar.

The following extract from one of the letters from Mr. Dovaston shows, on the one hand, the desire of our advanced entomologists to acquire all information respecting the *Coccoidea* and their allies, and on the other a determined effort to prevent, when possible, exotic species from getting a footing in the plant houses in ...

in the 'Gardener's Chronicle,' 1855, WESTWOOD
had roughly figured an insect which he called
Lepturum. This has since never been









identified. Whatever it may have been, it is no *Orthezia*. When I read your letter, before I looked at the insects, I hoped they might prove this species, which was imported into Kew Gardens from the Seychelles on palm leaves, but, at the time, for fear of introducing a pest, all the plants were carefully destroyed."

Explanation of Plates.

PLATE I.

Fig. 1. *Orthezia insignis*, adult female magnified, also with a plan of the natural size.
 Fig. 2. *Vinsonia stellifera*, female, mature.
 „ 2a. „ „ female, immature.
 Fig. 3. *Ceroplastes (vinsoni?)*, female, dorsal view.
 „ 3a. „ „ ventral view.
 Fig. 4. *Ischnaspis filiformis*, female.

PLATE II.

Fig. 1. *Lecanium mangiferæ*.
 „ 1a. „ „ part of the fringe, more highly magnified.
 Fig. 2. *Aspidiotus personatus*, dorsal view.
 „ 2a. „ „ side view.
 Fig. 3. *Planchonia fimbriata*.
 „ 4. *Diaspis cymbidii*, female scales.
 „ 5. „ „ male scales.
 „ 5a. „ „ male scale more highly magnified.

Wild Flowers of Georgetown: A Study in Field-Botany for Tyros.

By Exley Percival, B.A., Principal of Queen's College.

HE most enthusiastic lover of a garden will probably admit that, highly as we prize the fair floral denizens of what old writers call "the gay parterre," there is still a more potent spell than theirs in the simple wild flowers that deck every nook and corner of our Northern lands with ever-varying grace of form and colour. We all do willing homage to the stately rose that holds the unchallenged title of "Queen of the Garden;" but it is the wild brambling, the pink or white dog-rose luxuriating in the June hedgerows, that is dearest to poet and painter and to all true lovers of flowers. And so with other cultivated plants; we all admire them, and many of the old-fashioned favourites of the pleasant country gardens of farm and cottage—pinks and carnations, gilly-flowers, mignonette, sweet-lavender, and all the rest of the fragrant posy—are regarded with a sort of affection that new-comers and rare exotics fail to win. But the true names to conjure with are those of the wild flowers pure and simple: March daffodils and April primroses, cow-slips and violets, blue-bells and wood-anemones: and then the star-worts and red-robins and fox-gloves and honeysuckle in the winding lanes: and willow-weed and forget-me-nots and meadow-sweet by every brook and channel: and wild-thyme and nodding hare-bells and

the golden gorse that Linnæus thanked God for on the heathy banks: and, later on, scarlet poppies and corn-marigolds and bright blue corn-flowers among the ripening wheat: who that has ever roamed among these and their beautiful kindred does not feel the magic of their very names, recalling memories of bright scenes and happy days in by-gone years?

Few such associations may cling to the names of our local flowers, and it may be admitted that at first sight the coast-lands of British Guiana do not seem a very promising field for the unscientific botanist. The straight dams that take the place of our country lanes at home, and the trench-cut squares and right-angled parallelograms that do duty for fields, are not favourable to the growth of these wildings, which seem to choose homes of beauty by some sympathetic instinct. Still, we have many pretty, some fine, and a few very beautiful flowers, and a district in which the *Victoria regia* grows as a weed in any pond or trench is not altogether without claims to floral distinction. Nor is there any lack of material to work on; the casual observer, who may have noticed half a score of weeds and wild-flowers in and about the town, may be surprised to learn that, without including the grasses and sedges, there are at least three hundred kinds of wild flowering plants to be found within the limits of the ordinary afternoon walk or drive, some two hundred of which may be gathered in the Botanic Gardens alone. And if few of these have any striking beauty of their own, they form at any rate an interesting suburban flora, presenting examples of many important types, and a great variety of the wonderful adaptations of plant and flower to situation and mode

of life that help to make botany so suggestive and fascinating a pursuit to its students.

But, as with men and women, so with flowers; as soon as we begin to take an interest in them, we want to know their names; and here considerable difficulty has to be encountered. Few people here can tell us the names of a round dozen of our native flowers; and there is no one book, much less any popular and easily procurable book, from which they can be named. Most of the specimens of my own collecting could not have been identified without the help of my friend, G. S. JENMAN, Esq., F.L.S., our Government Botanist, probably the only person in the colony who knows the scientific names of our wild-flowers, great and small, almost as familiarly as a Bentham or a Hooker might know the British flora; and for many quaint and interesting popular names, which I have tried to make a special feature of this paper, I have to thank G. H. HAWTAYNE, Esq., C.M.G., whose knowledge of creole lore is well known to our colonists. My object being simply to help in naming the plants, and to suggest, rather than to treat in detail, some points of interest in their structure and habits, I have avoided as far as possible the use of technical terms and purely scientific characteristics, taking instead any obvious external features that may serve as guides: for which I am sure that scientific botanists will be the first to hold me excused, as they will know how impossible it is for a beginner to name a plant or to get the slightest idea of its appearance from the descriptions in botanical works, such as GRIEBACH'S valuable "Flora of the West Indies." Wherever possible the Botanic Gardens have been taken as the collecting ground, as they are visited

by all, and the wild-flowers found there are so representative of the whole sea-board that most dwellers on the coast may recognise a good proportion of their own acquaintances among the flowers described.

To begin with some small flowers that cannot fail to be identified, and will serve as a clue to several others; every one must know the little flattened rows of seed vessels, like tiny purses joined together, that cling to one's clothes after walking in long grass, so closely that even a visit to the laundress sometimes fails to dislodge them. They are locally called sweethearts, from their clinging and apparently affectionate disposition, which, however, a cynic might remark—if there were any cynics among the gentle race of botanists—is inspired purely by motives of self-interest, as we shall presently see. These sweethearts should not be confused, as they sometimes are, with the spiky and aggressive seeds or burs more properly called watchmen, found in similar circumstances, two of which may be identified later. The true sweethearts may readily be traced to a small plant with leaves of three leaflets and loose nodding racemes of pretty little pinkish purple flowers, turning leaden blue as they fade, and producing the curved, jointed pods that cling, either whole or in segments, to every passing body. These plants are the *desmodiums*, which are known as honeysuckles as well as sweetheart plants, though of course they have no affinity with the true climbing honeysuckles. The common ground honeysuckle or sweetheart-bush (*Desmodium incanum*) has pointed leaflets, conspicuously ribbed on the under side, and eight joints or purses in a full pod. The three or perhaps four other

kinds have rounded, trefoil or shamrock-like leaflets, and seldom more than four joints in a full pod. A comparison of one of these little blossoms with the flower of any of the peas or beans to be found in our gardens, will show that they are constructed on the same general plan, representing the type not inaptly called *Papilionaceous*, or butterfly-like flowers. In these the petals, or flower-leaves, are variously shaped, mainly to accommodate the insect allies on whose visits the successful setting of their seed depends. In the typical form the broad upper petal is generally erect and conspicuously coloured, and is called the *standard*; the two side petals, sometimes spreading, more often folded over the lower pair, are known as *wings*; and the two lowest, often partially united, form a sort of boat or *keel*, containing the fruiting organs. The fruit of such flowers is almost always a pod, as they belong to the important order of *Leguminosæ* or pod-bearers, which furnish us with a host of useful products, from the gum on our postage stamps to the timber of the lofty mora. As the papilionaceous are frequent and characteristic plants here, and easily recognised by the shape of their flowers and their unmistakeable pods, they will form a convenient group to examine first.

To begin with the yellow kinds; among the most conspicuous are the upright spikes of bright yellow flowers belonging to the rattle-wort or bisi-bisi (*Crotalaria retusa*), frequent on banks and open grass land. It has undivided leaves and grows from one to two feet high. As it is the only papilionaceous plant near town with these stiffly erect flowering spikes, it cannot be mistaken, even if the pods are not ripe enough to give the hissing

rattle, sounding very like that of the rattle-snake, that has gained the plant its scientific as well as its popular names.*

Another bright yellow flower of the papilionaceous kind is the yellow seaside pea (*Vigna vexillata*), with flowers that are held erect, three or four together, on longish stalks, whence the specific name from *vexillum*, a standard. It is a twining and trailing plant, with trifoliate leaves, the three leaflets narrow and pointed. A smaller, slenderer kind, of more twining growth, and very narrow lance-shaped leaflets, is the lesser yellow seaside pea (*Vigna luteola*). It may be distinguished from the last with certainty by examining the keel of the flower, which in this species is twisted like a ram's horn, while in the common seaside pea it is boat-shaped as usual.†

The other common yellow papilionaceæ are tolerably upright shrubs or bushes, running up to ten or twelve feet in height. Most land near town is periodically "wed," to use the local phrase, by the simple process of chopping everything down to the bare soil with a cutlass; a necessity no doubt, but a melancholy necessity for the botanist, who finds his half-explored treasure-ground of yesterday a barren waste to-day. Hence, many plants are most often seen as low herbs or shrubs that grow to a much greater height in any undisturbed locality.

One of these is the common sesban, or swamp-pea

* *Crotalaria* from Gk. *Krotalon*, a rattle. The rattle-snake is *Crotalus horridus*.

† Grisebach's *V. luteola* is mainly the *V. vexillata* of Bentham, and *vice versa*.

bush (*Sesbania ægyptiaca*), a straggling, thin-branched bush, of any height from one to ten feet, abundant in the autumn but dying down in the early part of the year. The flowers are yellow, and the greenish yellow exterior of the standard is profusely specked as if with tiny "blacks" from a smoky lamp. The leaves are *pinnate* or divided into several leaflets, in this kind from ten to eighteen pairs, and the numerous long narrow pods are compressed between each seed, so as to give them a studded, almost beaded appearance. Its fibre is used in the East for rope-making, but it cannot be said to be either useful or ornamental here, though too common to be passed without notice.

A more valuable plant, the pigeon-pea or no-eye-pea (*Cajanus indicus*), of East Indian origin, has been so long cultivated throughout tropical America that it often occurs as a wild plant. It is too familiar to residents to need description, but may be characterized for newcomers as a slender bush six or eight feet high, with grey-green trifoliate leaves, yellow flowers, and pods with slanting depressions between each pea, producing a diagonally striped appearance. This pea is the most easily cultivated crop we have, requiring neither clearing nor subsequent weeding of the ground; the only hard work seems to fall on the daughter of the house, who has to cry the produce through the town in the shrill nasal accents that we know so well.

The last yellow papilionaceous flower that we need mention belongs to a slender shrub at once distinguished by its sensitive pinnate leaves, the marsh shame-bush or bastard sensitive plant (*Æschynomene sensitiva*). It is common near water, and has small yellowish flowers

often shaded with purple. Though not so sensitive as the true shame plants (*Mimosa*) its younger leaves soon close at a touch. The purpose served by these singular irritable movements, in these and many other widely distributed plants, is so doubtful that it would be useless to attempt to discuss the question here.

The true sensitive plant most often found near town is *Mimosa polydactyla*, a pod-bearing but not a papilionaceous plant, having tiny pinkish-white blossoms clustered in roundish heads close to the central stem; the highly sensitive leaves are very ornamental, with several spreading segments or fingers, each one cut into numerous pairs of small narrow leaflets. The accepted formula among children here is to point a reproving finger at the plant, saying "fie, for shame," when the leaves double up and seem to try and hide themselves away.

Another native sensitive plant may be found at the side of the second lake in the Gardens near the iron bridge. It has yellow heads or tufts of flowers, and pretty cockade-like leaves with six leaflets, each again divided into numerous smaller ones. The pods, about an inch long, form an irregularly star-shaped cluster. This is the water shame plant (*Neptunia oleracea*). Its spreading stems are worth examination; so long as the plant is growing on land, it has ordinary hollow stalks; but as it advances into the water a thick wrapper of spongy or woolly texture forms round the branches, so that they float buoyantly, sending down roots towards the ooze below. Thus the plant always follows the water, floating as it rises and rooting in the shallows as it falls.

Before we return to the papilionaceous flowers, this

will be a convenient place to notice some other conspicuous yellow pod-bearing plants which will be easily recognised as true leguminosæ by their pods and pinnate leaves, resembling some of the species described, although their flowers are not of the pea-flower shape.

The akasee is a slender shrub with round stalked heads of little yellow flowers, not unlike those of the water shame plant, prettily pinnate leaves, not sensitive to a touch, but soon closing up when gathered, and a pair of spiny prickles opposite each leaf-stalk along the stems. It may be seen on the Lamaha dam opposite the Cricket Ground, and in many other places. No plant could have more contradictory popular names than this; akasee no doubt represents *acacie*, the plant being *Acacia Farnesiana*; but it is also called sweet-briar from its sweet-scented flowers, from which a favourite perfume is extracted in India; on the other hand the roots and woody stems have a strong and disagreeable odour when bruised or cut, which has gained the plant the gruesome name of deadman's flesh. The juice of the roots is said to be a strong poison, but the scraped pods are good for toothache—whence it is sometimes called tooth-ache tree—and their gummy juice for mending china. The juice from the stems is too fluid to serve as gum arabic, which is obtained from a very similar eastern Acacia, which may be found among the trees planted along Croal Street.

The wild cassias we shall meet with are shrubs or small trees with showy yellow flowers, pinnate leaves and variously shaped pods that turn black as they ripen. Perhaps the most conspicuous is the carrion-crow bush, or johnny-crow bush (*Cassia reticulata*), common as a more or less

dwarfed shrub along roadsides, and growing twelve to fifteen feet high in undisturbed positions; large specimens may be noticed on the south Lamaha dam just above the pumping-engine on the Vlissengen Road. It has from four to a dozen pairs of large oblong leaflets, broadly rounded at the end, bright yellow flowers, and long flattened pods marked with cross-lines between each seed. Almost as tall, but slenderer and less branched in its growth, is the miama (*Cassia bacillaris*), used to rub stains from clothes. The leaves have only two pairs of broadly ovate and pointed leaflets, and the flowers are large and creamy yellow, succeeded by nearly cylindrical pods. It grows on the Lamaha dam, near the last species, and in many other localities, and is generally conspicuous among the bushes at the top of the Gardens. Two smaller kinds found in town, and common, to give an exact locality, in and about the Kitty Village, are called stinking-weed or stinking-wood from the strong physic-like smell that has rather unjustly gained the name of carrion-crow bush for *Cassia reticulata*. The slenderer kind, *Cassia occidentalis*, has four to eight pairs of rather oval and distinctly pointed leaflets and narrow elongated pods from two to four inches long. The other, commonly called money-bush *Cassia bicapsularis*, has a thick shrubby growth, nearly cylindrical pods from three to eight inches long, and three pairs of oval leaflets, the lowest and smallest pair almost circular, like counters or thin coins. The wing-pod cassia, called ring-worm bush, *Cassia alata*, has many oblong rounded leaflets, the lowest pair at some distance from the others, and is best distinguished by its four-sided, shortly pointed pods with a membran-

ous border or wing running along each angle. Several other kinds are grown in gardens and sometimes found wild, most of them possessing in some degree the bitter medicinal properties that we probably became acquainted with in early life in the form of senna tea, obtained from *Cassia obovata* and other species. We may also just mention the allied Barbados pride or Barbados flower-fence (*Casalpinia pulcherrima*), which often springs spontaneously in cultivated ground, an ornamental shrub or small tree with bright orange-red or yellow flowers, twice-pinnate leaves, and black pods like ordinary pea-pods.

Having thus disposed of the yellow leguminosæ most likely to be met with, we may return to the papilionaceous kinds, and, still taking colour as our guide, identify another of the group common on grassy land, with very dark lurid red or maroon-purple flowers, which is a wild cinabone called wild gully-root (*Phaseolus semi-erectus*). The curiously twisted keel and the small standard are of a smoky pinkish colour; the pods long and linear, and the leaves trifoliate with rather arrowhead-shaped leaflets. The common gully-root (*Petiveria alliacea*) grown in every yard is a plant of a very different order, allied to the calalu and poke-weeds; it is a shrubby herb with entire lanceolate leaves, and is best distinguished by its long slender spikes or sprays of minute white star-like flowers with four rays to each star. It is also called guinea-hen weed and strong-man's weed, and is an important ingredient in certain nostrums of the local wise women.

The white papilionaceæ are less certainly identified, as some of the blue and purple kinds occasionally

“sport” to white, and the commonest white kind, the lablab or bonny-vis (*Dolichos Lablab*), that produces our local green peas, often turns to lilac or purple. When found wild, however, it is generally white, and may be known by the broadly ovate and pointed leaflets of its trifoliate leaves, and the numerous small protuberances that roughen the upper edge of the pod. It is familiar as a cultivated plant, trailing on fences in most provision grounds. A white phaseolus or cinabone, the sugar-bean (*Phaseolus lunatus*), may be recognised by the spirally twisted keel, characteristic of this genus; and the bat’s-wing-pea (*Lourea vespertilionis*), rare here, a small erect pea, with white corollas and single bilobed leaflets, is said to occur in the Gardens, but I have never found it near town.

The small tree, *Agati grandiflora*, with numerously pinnate leaves, pendulous pods a foot or more in length, and very large white or rosy papilionaceous flowers, a good three inches long, is thoroughly naturalised in many parts of the colony, but only occurs in town as an introduced plant. A good specimen is near the third lake in the Gardens, about forty yards from the wooden bridge passing to the central avenue. Lastly, the small white-flowered liquorice vine or crab-eye vine is a climbing and twining plant with long, narrow, pinnate leaves, and pods containing several bright scarlet seeds with a black spot at the end, often used for children’s necklaces. It may be seen climbing on the roof of the summer house in the central avenue.

Here colour ceases to be a sufficiently definite guide, and we may conveniently divide the rest of the papili-

onaceæ into two sets, those with small flowers a quarter of an inch long or less, and those with fairly large and conspicuous blossoms, an inch to over two inches long. Of the first, the sweetheart plants have already been mentioned ; the others, if erect and shrubby, will be indigo bushes (*Indigofera*) ; if a small creeping plant found in open grassy places, with single leaflets, minute reddish pink flowers of various shades, and bundles of pods looking disproportionately large for the slender stems, it will be the Demerara clover (*Alysicarpus vaginalis*), really an East Indian fodder plant, but now a common and very variable weed here and throughout the West Indies. Of the indigo bushes, slender shrubs with pinnate leaves and little spikes of inconspicuous flowers with pinkish wings, two kinds are common here : the true dyer's indigo (*Indigofera tinctoria*), with pods over an inch long and rounded leaflets ; and the wild or Arab's indigo (*I. Anils*) with little pyramids of half-inch pods and narrow leaflets. Both grow together on the Lamaha dam near the yellow cassias mentioned. Their industrial importance is well-known.

The larger kinds will be either the seaside beans (*Canavalia*) or the blue and purple pea-flowers (*Clitoria*). Here the shape of the flower will be our best guide ; the seaside beans have typically papilionaceous flowers with the standard uppermost, more or less erect, and not enclosing the wings and keel ; they are trailing and twining plants, with large trifoliate leaves and purple flowers, found at the Kitty corner, &c. In the clitorias the flower is reversed so that the standard lies underneath, folded so as to form a sort of bowl or oval shell

enclosing the rest of the flower. A very ornamental kind with bright blue and white blossoms, the blue pea-flower or blue vine, though a doubtful native, is thoroughly naturalised along the north trench in the Gardens and is common along the road to New Amsterdam, perhaps escaped from gardens, where it is often cultivated. Two pea-flowers with similarly shaped white blossoms streaked and shaded with purple, can be distinguished by the pods, which are short (one to two inches) and four-sided in the lesser kind (*Clitoria glycnooides*), long and flattened in the greater purple pea-flower (*C. Poitæi*.)

Among the larger trees near town belonging to the pod-bearing order may be mentioned the tamarind (*Tamarindus indicus*), the saman (*Pithecellobium Saman*), the handsome scarlet and white flamboyant (*Poinciana regia*), and the oronoque (*Erythrina glauca*), whose red and yellowish flowers, often found strewn in the avenue at the Gardens, are called "fowl-cocks" by the children here from their resemblance to a cock, or at any rate a weather-cock, when held upside-down by the large red or orange standard that forms a perch for the bird.

It would of course be impossible to treat the other groups of plants in the same detail that is here given to the papilionaceæ. But it is a good plan in botany to begin by examining some one group carefully, and many clues will be gained, and many points of interest discovered, by any one who studies this well-marked series, most characteristic of our flora, ten or a dozen species of which may be gathered in the course of an easy stroll; for instance, up the south Lamaha dam, for a couple of hundred yards past the Queenstown bridge.

The twining seaside peas and clitorias may naturally suggest the question, how do plants climb? The answers to which are full of variety and interest, only to be briefly touched on here. Every plant mentioned may be found in the avenue at the Gardens, where the study of tropical botany may be carried on under much more agreeable conditions than are often imposed upon its votaries. But it must be remembered that many of the ornamental flowers there are introduced species, and therefore not mentioned here unless they are thoroughly naturalised. I once heard a well-known old planter stoutly maintain a pet theory of his, that plants had some sixth sense unknown to us, even if they could not actually see what they were about by some strange vegetable form of vision. "For," said he, "just plant a yam anywhere, and three or four feet away put in a likely stick; and in a few days you will find that that yam has made a bee-line for the stick and climbed up it. How could it do that without sense?" The facts are indisputable; and if the solution is not so paradoxical as the argument infers, it is no less wonderful as a simple yet perfect adaptation to a given end. In twining plants the powers of movement, common to all plants in a greater or less degree, are so specialised in the long growing shoots that each sweeps round a considerable portion of a circle in a few hours' time. Over grass or slight obstacles they pass unchecked, but as soon as they reach a branch or sapling strong enough to interrupt their course, and therefore adequate as a support, they twine round it by the same sort of impulse, gradually and persistently given by the growth of the plant, that makes a whiplash twist spirally round any like obstacle. Thus they

seem by the result to have some conscious power of selecting and travelling straight to a suitable support. It is, naturally, mostly plants with slight, tough stems, that climb in this rather crude fashion, by twining their whole body, so to speak, round the chosen prop. Many others economise their forces and materials by throwing out slender tendrils of various forms, often so sensitive as to deflect at the slightest touch, to support the main stem as it climbs. Such are the passion-flowers, found here in most parts, but nowhere very abundantly. The general character of the flowers is too well known to need description. The largest kind is the simaton, bell-apple, or water-lemon, *Passiflora laurifolia*, with oval, entire leaves, and large flowers in which purple and white are the predominant colours. Its yellow fruits are familiar to all. The wild simatou (*P. fatida*) has hairy leaves and stems, white flowers tinged with pink, and a curious mossy net-work round the fruit, which has gained the plant the poetical name of love-in-a-mist. *P. biflora* has abruptly half-round leaves that look as though they had been artificially cut to a half-circle, and whitish flowers. Two or three other kinds may be met with, but are too sparse to need description here. We may also mention a common wild cucumber (*Cephalandra indica*), with a five-lobed white, rather downy corolla, that at first sight might be taken for a bind-weed or convolvulus but for its spiral tendrils and pendent melon-like fruit. This is condemned in the Gardens as a troublesome weed, but might plead that it is quite as pretty as many cultivated flowers. Climbing among grass or low bushes may be found a delicate little plant of the same order, that will be recognised

at once as a perfect melon plant in miniature, with the characteristic rounded, more or less distinctly five-lobed leaves, yellow flowers, and pendulous melons about half an inch long, that would make a handsome dessert dish for a fairy feast. This is the small wild melon (*Melothria pendula*), whose fine tendrils seem specially suited for twining on grass. Another small climbing plant, abundant in the same places, is the heart-pea (*Cardiospermum microcarpum*), which has leaves prettily cut into three lobes, each again divided into three, very small white flowers, and inflated capsules, each of its three divisions containing a blue-black seed when ripe; just below the flowers is a pair of opposite tendrils in short flattish coils something like a watch-spring. The climbing securidaca, or purple climbing milkwort (*Securidaca volubilis*), common in the avenue, with a rich inflorescence of small winged pinkish-purple flowers in loose clusters, climbs by taking a single turn at intervals round its support with a tough twiggy loop or hook formed by part of the stem. Some tendrils are further specialised for scrambling on rough surfaces as well as twining. The common bignonia called bird's-foot or catclaw, and sometimes Barbados trumpet-flower (*Bignonia unguis*), with large yellow tubular flowers and two leaflets to each leaf, will be found to have three little clawed processes to each tendril, which cling to rough bark or to the back of the hand, when drawn across it, like the claws of a tiny bird.

In many climbing plants prickles or hooked thorns take the place of tendrils. Some of the palms, which do not come within the purview of this paper, are among the best examples of this; such as the *Calamus longipes*, in

the row of trees at the back of the new band-stand, whose leaves end in long whip-like lashes holding by numerous pairs of recurved hooks. But a good native type among our wild-flowers is furnished by the grey and yellow nicker trees or chick-stone trees (*Guilandina Bonduc* and *Bonducella*), of which climbing specimens may be found half-way up the avenue, as well as near the palm just mentioned ; they are easily distinguished by their large twice-pinnate leaves armed with many curved prickles on the ribs and stalks, which catch at so many angles and hold with such tenacity that it would be difficult to extricate oneself if fairly caught. Hence these bushes used to be planted on the sides of entrenchments in Barbados as an additional defence.*

On the oronoque next below the wooden side-bridge leading to the south lakes may be found a fine specimen of one of the cooper-trees, satirically called "Scotch attorneys," which climb by throwing out pairs of roots at intervals, clasping the supporting tree-like hoops upon a cask. At first they are soft and pliant, but gradually become rigid and woody, and often ultimately strangle their helpless host. The kind before us is the star-of-night or balsam fig (*Clusia rosea*), with very handsome large rosy white blossoms with a curious yellow centre-piece. The strangling roots are not so prominent in this specimen as they would have been if it had chosen a younger tree, still growing, as its host.

At the foot of these oronoques in the avenue may be found several examples of the simplest and most imper-

* Hughes' Natural History of Barbados, 1750. For this and other curious old books, from which many facts have been gleaned, I am indebted to N. Darnell Davis, Esq.

feet mode of climbing, when a weak-stemmed plant just scrambles up by leaning on any support it meets, without special means for holding on. In this way the common, rather coarse-looking wild marigold or yellow ox-eye (*Wulffia stenoglossa*), straggles up for ten or twelve feet among the bush. And everyone must notice the pretty pale-yellow flower (*Asystasia coromandelina*), abundant about the roots of the trees, and trailing among the grass, which it seems agreed here to call a primrose, though it is little like the real primrose except in colour. We might call it the African primrose from its original home, but it is now quite naturalised here in several parts.

Some plants climb down instead of up, like the figs, which germinate from bird-dropped seeds on the branches of trees, and at once begin to make for the ground by slender hanging and trailing roots; these twist together as they go, and at last, gaining new vigour like the fabled giant from touching mother-earth, form stout trunks which support the plant as an independent tree after its host has fallen. There are several native figs in various stages of their growth in the avenue. In the tree stage we may notice one just above the round summer-house, which, when fruiting in the autumn, is covered with a multitude of little pea-shaped figs, pale brown spotted with red, which provide a rare feast for the kiskadees, ground doves, and other birds. On the south side of the avenue, about a hundred yards below the cross road, we shall find a small tree, apparently with four trunks, that well illustrates the manner of their growth. The aged oronoque on which this fig was growing fell in a sudden squall about two years ago, when the hang-

ing roots had just reached the ground, but were still too thin and flexible to support the parasite, or rather epiphyte, as an independent tree; but it was raised and propped up at its original height, and now the roots, though they have not twined together to make a central trunk as they would naturally have done, have developed into four stout supports enabling the tree to stand alone. On the oronoque next below this may be seen a fig in its earlier parasitical stage, sending down roots to the soil, but still growing on the branches of its host.

Taking another line of enquiry, and returning for a time to the little sweetheart pods that cling to every passing body, we shall find that this is but one of many ways that plants have of disseminating their seeds as widely as possible in fresh soil. Whether these adaptations are due to creative design, or gradual evolution, or both, need not be discussed here; the end attained is the same in any case. It is well known that land will not bear fresh crops of the same kind year after year without exhaustion; every farmer knows that after two or three years his plantains or bananas fall off so much that it is useless to keep the old beds under the same cultivation; and the rule applies to all crops, though some exhaust the soil more rapidly than others. Hence if a plant always dropped its seed, as unadapted seed would drop, upon the ground beneath it, fewer and fewer of its seedlings would survive each sowing, and the enfeebled plant would ultimately disappear, ousted by stronger rivals. But there are endless means by which plants find new nurseries for their progeny. Some seeds, as we have seen, are provided with bristles or spines or hooks, so that every passing animal carries

them to fresh woods and pastures new. These are mostly weeds of cultivated lands, where such means of conveyance are frequent. Besides the desmodiums, we constantly see and help to distribute at least two other seeds, one of which, a small roundish kind beset with bristling points, something like the iron caltrops that used to be thrown in the way of advancing cavalry, is the fruit of the bur-grass (*Cenchrus echinatus*); the other is more like a small canary-seed enveloped in spiny bracts, and grows on the long thin spikes of the watchman plant (*Achyranthes aspera*), a common weed among grass. This plant is given the jesting name of man-more-than-man, the point of the joke being to get some one to take the long spike in his hand to puzzle over the reason for this strange name, when the questioner gives a practical answer by drawing it smartly through the closed hand and leaving the man *plus* several little "pimplers" fastened in his fingers.

Other plants have variously shaped wings to their seeds, so that in their fall from a height they are carried to some distance from the parent tree. One instance of this is the climbing securidaca described above, which has a delicate membranous wing about an inch long to each small seed. But a still prettier and more elaborate device is found in the fruit of the handsome Long John trees (*Triplaris surinamensis* and other species) that adorn many of our roads and gardens. Here the seed is contained in a capsule provided with three brown leaf-like wings or blades, an inch and a half long, the whole on the plan of a small shuttlecock with three feathers. These wings are so bent that the fruit spins rapidly as it falls, and so

descends steadily and gracefully like a little parachute, often travelling to a considerable distance before it touches the ground. One would think that this spinning principle might be applied to the upper part of real parachutes, as it certainly gives great slowness and steadiness to the descent. A like plan is differently developed for smaller and lighter seeds in pappus-bearing plants like the thistle or dandelion at home, and several familiar weeds out here of the groundsel type, where silky or bristly hairs, sometimes rayed at the top to form a parachute, sometimes spreading like the feathers of a shuttlecock, serve to waft the seed to long distances upon the breeze. In this way the Scotch thistle has been blown through the length and breadth of Australia, till it has become quite a dangerous enemy to cultivation in many districts. Perhaps the prettiest example of this mode of conveyance here is to be seen in the bastard ipecacuanha, blood-flower, or red-heads, (*Asclepias curassavica*), a roadside plant with narrow leaves and conspicuous umbellate heads of red flowers with curious bright yellow cup-shaped appendages in the centre. On opening the green envelope of the fruit the white seeds are seen arranged in a symmetrical fish-scale pattern forming a sort of cone; each seed is attached to the centre by a bundle of flossy hairs, which become feathery as the seed browns and ripens, and at the right time sail away before the wind to some new home.

Some plants grow by the water-side, and simply drop their fruit, enclosed in a floating pod or capsule, for the currents to drift into fresh quarters. The spiny pods of the nicker trees described above have thus been

borne not only to all tropical shores, but even to the far Cornish and Scottish coasts. Others send out long runners, which bear flowers and seeds some distance from the parent plant. Thus the creeping shoots of the nanny-foot convolvulus described below run a hundred feet and more along the ground. In others the seed vessels become elastic and burst when ripe with a sort of explosion, scattering the seeds in every direction. This is the case with the wood-sorrels, a pretty little erect kind of which, *Oxalis Plumieri*, known here as "popguns," may be found everywhere in shady or half-open places, with trefoil leaves and small pinkish-white flowers stained with yellow in the centre. A smaller prostrate kind, with delicate olive-brown or green shamrock leaves and yellow flowers, *Oxalis corniculata*, is a frequent and not unwelcome weed in gardens and ferneries. But the most notable instance of this type is the sand-box tree (*Hura crepitans*), the woody rosette-shaped fruits of which are commonly used here as paper-weights. These burst with quite a loud report when ripe, projecting their seeds twenty yards or more away. When they are taken home as curiosities without being prepared as usual by pouring melted lead into them, they are apt to cause considerable alarm by going off in drawer or cupboard some warm day like so many infernal machines. Before blotting paper came into use, these fruits were used to hold the fine sand that stood ready on every writing table to sprinkle on the wet ink; whence the name sand-box tree. Then there is the endless series of berries and succulent fruits, in which by every imaginable modification of form and colour, animals, and especially birds, are invited to assist in the dispersion of the seed. Thus

we see the sticky seeds of the common bird-vine and the red-stemmed bird-vine (*Loranthus Theobromæ* and *ruficaulis*) carried by the kiskadees that have feasted on the berries to the very branches that these plants need to germinate upon, though many unfortunates get planted on iron railings and other unpromising sites. And thus the loafing idler who knocks down a tempting mango from its parent-tree, and after a brief and stolen indulgence throws away the seed a quarter of a mile further on, is unconsciously carrying out one of the great purposes of nature in a rather different way.

An important order, the composite-flowered plants (*Compositæ*), can be dismissed briefly here, as although it is computed to contain over ten thousand species, the local kinds are mostly small and unimportant. Perhaps the most ubiquitous weeds of our roadsides and waste grounds are two little plants with small, dingy lilac, groundsel-like flowers, which become rather more conspicuous, though scarcely more beautiful, when the whitish pappus begins to appear. The stouter kind, with rounded undivided leaves, is called soldier's tassel from the resemblance of its seeding flower-heads, on a small scale, to the ornament that used to be worn on the fronts of soldiers' caps. The weaker and somewhat less abundant kind has narrow leaves variously jagged and cut, and is known as thistle-weed. In plants like these what is commonly called the flower is really a flowerhead, containing a number of tiny separate flowers. Thus if we pick a flower of the little cultivated daisy-like feverfew (*Pyrethrum*) that forms a border to the Oval at the Gardens, we are really gathering a bunch of more than a hundred and fifty minute

flowers, of which a score or so are white and flattened, composing the *ray*, and the rest yellow and tubular, forming a central *disk*. The three chief types are, those that have both disk and ray; those that have only flattened or strap-shaped ray-florets, like the dandelion; and those that have the central disk only, like the little weeds just described. A larger relative of the soldier's tassel is a shrub found on the Lamaha dam, &c., where the white or faint-purplish groundsel-shaped flowers are set in rows on spreading twiggy flower-stalks, each stalk rather twisted at the end in the form called *scorpioid*, from a fanciful resemblance to the up-turned tail of an angry scorpion. This is the bush fleabane (*Vernonia scorpioides*), rather conspicuous from the number of its small white flowers. A twining composite is also common, which displays its numerous white flower-heads, fringed with the projecting stamens, on the top of any low bushes. It is the only twining species near town, and is a climbing guaco called bitter tally, reputed a sovereign specific for snake bites. Anywhere among grass may be found an erect or partially procumbent plant with narrow leaves and round white flower-heads the size of a sixpence, which have a feeble attempt at a ray, only forming a minute fringe round the disk. This unimportant-looking little plant (*Eclipta alba*) called congolana, is said to be of great virtue in "lung troubles" of all kinds, and a good dressing for cuts or any wounds. An infusion of its leaves will also dye light hair black if required, but ladies may regret that an allied species, used by the ancient Romans to dye dark hair a pale golden colour, has not yet been found in these parts.

The only other composite we need mention here is the white sow-thistle (*Erechtites hieracifolia*), rather common on waste lands near town, a stoutish, rather thistle-like, but not prickly plant, two or three feet high, with dingy white flower-heads. Several other small-flowered yellow or white composites will frequently be met with.

Another very important order in temperate regions, the umbel-bearing plants (*Umbelliferae*), typical forms of which are the celery, parsley, carrot and other plants cultivated in the colony, has few representatives near town, and those not typical. The penny-worts have round platter-like leaves stalked in the middle, and small rather wheel-shaped umbels of tiny white flowers. The marsh penny-wort (*Hydrocotyle umbellata*), also called sheep's bane, and foot-rot—the last names pointing to poisonous qualities not rare among the umbelliferae—is common at the edge of water, and may be seen in the second lake at the Gardens, where it will be at once recognised by its round leaves, about two inches across, held sideways like targets a few inches above the water. A very small and delicate kind, the dwarf penny-wort (*Hydrocotyle asiatica*) is often found creeping close to the ground in moist and shady places, especially affecting flower-pots and ferneries.

The only other representative of the order is a plant called fitweed or fever-weed from its medicinal virtues, (*Eryngium foetidum*), more like a low-growing soft-leaved thistle than a true umbel. It may be distinguished by its star-shaped tufts of slightly prickly leaves, and green heads with very small inconspicuous white flowers. It is a near relative of

the handsome sea-holly whose blue flowers and prickly glaucous leaves are a characteristic feature of our sandy shores at home.

The larger umbels, such as cow-parsnip and wild angelica, are great favourites with artists at home for foreground effects, often mingled for contrast with the broad leaves of the butter-bur or some similar plant. Our local artists might replace them by some common weeds, not beautiful in themselves, but picturesque and effective in composition. Instead of the umbels might be put the tall spikes of the man-piabba, or giant woundwort (*Leonurus nepetaefolia*), conspicuous for the large spiny ball-shaped flower-heads, with tubular orange flowers, arranged at intervals round the square central stem. A slenderer kind, really belonging to a different genus, is called the woman-piabba (*Hyptis capitata*) which has round flower-heads the size of an ordinary marble growing on short stalks in pairs up the stems. The flowers are white and inconspicuous. It is also known as wild hops, and large specimens of it, four or five feet high, are sometimes improperly called man-piabba. The name woman-piabba is then given to the white spikenard (*Hyptis pectinata*), a still slenderer plant, common everywhere in waste land, in which the small whitish flowers, almost hidden by the calyx, are clustered towards the end of the erect stems, not gathered into round heads. The true West Indian spikenard (*Hyptis suaveolens*), does not occur here wild; but a very aromatic species (*Ocimum micranthum*) with spikes of little flowers in which the toothed calyx is more conspicuous than the corolla, is found sparsely by roadsides, and is called wild balsy—a corruption of basil, not bal-

sam—or mosquito bush, from being used by particularly sanguine persons in the hope of keeping away those insects. Its affinities may be recognised from its square erect stems and generally sage-like character.

The broad leaves of the butter-bur might be replaced in local sketches by a common and characteristic weed that takes its name from this colony (*Solanum demerarens*), the wild bru-bru or Demerara night-shade, easily recognised by its large, coarsely jagged leaves, armed with numerous formidable prickles, its green, yellow, or red berries the size of a small marble, and radiating bunches of small flowers, something like those of the potato, white or pale purplish with yellow stamens. The potato is itself a night-shade (*Solanum tuberosum*) and its leaves and berries share the poisonous properties that have gained for these plants their popular names of canker-berries, poison-berries and mad-apples. Another common bru-bru of similar habit, the Jamaica night-shade (*Solanum jamaicense*) has softer, almost downy leaves and stems, with fewer and shorter, more recurved prickles. A small slender, unarmed kind may be recognised by the character of its flowers and berries as a night-shade (*Solanum nodiflorum*) ; it is used by the "wise women" in some of their mysterious teas under the name of bitter goomah, and is harmless enough to be boiled as a spinach known as branched calalu. To include the other allied flowers, we may notice here an ornamental climbing species, the local bitter-sweet (*Solanum Seaforthianum*) which has sprays of pale blue flowers with yellow centres ; it is often cultivated in gardens, but is an indigenous species, running wild in the central avenue of the Gardens. Here also may be found a not

uncommon plant, the bastard jessamine, evening cestrum, or blue poison-berry (*Cestrum vespertinum*), with long woody stems and tubular greenish-white flowers, about an inch long, sticking out in a spiky way along the branches: and here or on the Lamaha dam we shall sometimes find the curious bladdery fruit, green with purple veinings, of the pop-vine, cow-pops, or winter cherry (*Physalis angulata*), whose small white flowers with yellow stamens declare its affinity with the night-shades. It is held here in great repute as a remedy for dropsy.

In this land of trenches and water-paths the marsh and aquatic weeds supply us with several of our finest wild flowers. The magnificent *Victoria regia* need only be mentioned here to express a regret that in recent years some leading botanists have robbed it of its dedication to the young queen, in the first year of whose reign its discovery by Schomburgk up the Berbice river excited such enthusiastic interest, and have prosaically classed it as *Euryale amazonica* with some obscure East Indian plant. The large and small white water-lilies need only be referred to their scientific names, *Nymphaea ampla* and *blanda*; and a marsh lily with white hanging ribbon-like petals (*Crinum Commelynii*), common on tidal banks near town, could not be mistaken for any thing but a lily, in spite of the rather spidery look of the flowers. But we must specially notice the pontederias, among the handsomest of our trench-plants, the most conspicuous and commonest of which has large spikes of pale mauve or lilac flowers, the upper petal of each marked with a yellow spot bordered with a violet tinge, and inflated stems that enable the whole plant to float freely; this is the greater pontederia (*Eichornia*

speciosa), known as massowah grass—said to be a corruption of Missouri grass—and as chinee-grass in the Canje creek, where of late years its floating masses block the wide water-way, completely hiding the water, for considerable distances in certain parts; as some of us know to our cost, having had perforce to lie-to in it, the helpless and sleepless prey of mosquitoes and insects innumerable, both small and great beasts, through the long hours of a tropical night. Another common native kind, the lesser pontederia (*Eichornia azurea*), with shorter, less showy heads, and no yellow in the flowers, may be found in various trenches round the town and on the second lake at the Gardens; and near it is established the purple pontederia, (*Eichornia tricolor*), with loose spreading racemes of smaller violet flowers, with two patches of yellow on the upper flower-leaf.

Most of the other ornamental flowers in these lakes are introduced from various countries; but we may notice an indigenous plant, self-introduced, in the rather large and handsome primrose-yellow three-petalled flowers of the yellow water plantain or water primrose (*Hydrocleis Humboldtianum*); it is abundant among the sacred lotuses on the first lake, and in the pool in the "zoo," and not uncommon in our trenches, as for instance in front of Ruimveldt, but can only be seen blooming in the morning hours. A little trench-plant named after the same great traveller (*Limnanthemum Humboldtianum*), with flowers easily distinguished by their five distinctly fringed white petals, may often be found among it.

As light and air are not so lavishly supplied under

water as above it, most water plants are adapted to their life in one of three ways: either they float their leaves upon the water, drinking in sufficient air from their broad surfaces to supply the whole plant, as in the water-lilies; or they float bodily upon the water like the pontederias, and the little *salvinia* (*S. auriculata*) that constantly covers the end of the third lake, in spite of the tons of it that are periodically removed; and the tiny reddish, imbricated and moss-like *azolla* (*A. caroliniana*) that mantles the surfaces of the trenches in sheltered parts; or, lastly, they have their leaves so finely divided into hair-like segments, on the same principle as a fish's gills, that they are able to live under water, presenting sufficient surface to obtain the supply of air that is as necessary for plants as animals. But if they are flowering plants, the blossoms must be matured above the water, and hence special flowering stems are sent up, sometimes spirally twisted so as to rise and fall with the water, sometimes supported by floating leaves quite unlike the lower leaves in general appearance, though it will be found that the external outline is the same in both. A familiar example of this is the water-shields or blanket-grass (*Cabomba aquatica*), far too abundant for planters—and anglers—in the Lamaha and all fresh water trenches, whose little stalked yellow flowers are supported by a few small floating lily leaves, while those under water are quite filamentous. The bladder-worts, common up the Lamaha and in the second lake, with spikes of small yellow "snapdragon" flowers, do not need this support, as some of the finely-divided submerged leaves are covered with tiny bladders which keep them floating near the surface. These plants are

so thoroughly adapted to a floating life that many of them do not produce roots at all, but depend for nourishment on what they find in the water. It is probable, however, that they are to a great extent carnivorous in their habits, like the sun-dews, Venus's fly-trap, and many other kinds of plants. The little bladders are so fitted with valves and bristles that each one acts as a trap or crab-pot for catching the minute water-fleas and other animalcula with which the water abounds, and the bodies of these victims appear to be assimilated by some process of vegetable digestion that is not yet thoroughly explained. Besides the larger kind, with its finely-divided leaves spreading out under water—a graceful plant for the aquarium,—a very small-flowered kind (*Utricularia obtusa*) will be seen in patches here and there, with floating rafts of matted leaves and stems like bundles of green horse-hair. Two or three other kinds common up the Lamaha, one a pretty blue and yellow water snap-dragon, do not seem to have reached town. These plants may be particularly commended to microscopists, as more definite information about their carnivorous habits can only be obtained by them.

We must now hasten to bring our wanderings among the wild flowers to an end, but there are still many common plants unmentioned which must be included to make our survey fairly complete. Perhaps our best way will be to take a final stroll through the Gardens, and then to visit the Kitty corner, where several characteristic sea-shore plants have established themselves on the sands that were open sea a few years ago.

In the open parts of the Gardens where the grass has not been too recently cut we shall everywhere find Deme-

rara clover, sweethearts, thistle-weed, and soldier's tassel, and the leafy heads and little pale mauve flowers of *Beloperone nemorosa*, a very variable weed ; the stems are wiry and straggling, and the heads are formed of dense over-lapping leasy bracts, making a four-sided blunted spike from one to four inches in length ; the five-lobed corollas peeping or hanging from these heads are sometimes almost noticeably pretty, but more often small and insignificant. More sparsely will be seen the congo-lana, the dark papilionaceous flowers of the wild gully-root, and the conspicuous petunia-like blossoms, mauve-blue shaded with indigo, of the spirit-leaf, snap-dragon, menow-root, or minnie-root (*Ruellia tuberosa*) ; the two last names may be a corruption of many-root, as it has large bundles of tuberous roots, "good for *all* diseases," as I am certified by a local "wise woman," but the origin of the others is unknown to me. We may also notice here and there a neat-looking herb with lanceolate, serrated leaves, which catch the eye by the symmetrically "twilled" look given by the indented ribs ; it is known as the wild green-tea bush, and is said to make good tea as a drink, not a physic ; the close-bristling, rounded, and ternately divided capsules are more conspicuous than the minute white flowers. The same name is sometimes given to one of the broom-weeds (*Capraria biflora*), a shrubby herb, which grows two or three feet high, commonest near but not on the sea-shore ; it has lanceolate, deeply serrated, not twilled, leaves, and little five-cleft white flowers, and is also called wild senna and goat-weed. A smaller and slenderer kind found by road-sides, in the Kitty village for instance, with delicate white flowers

growing up the stalks in an interrupted leafy spike, and narrow serrated leaves, is the sweet-broom or liquorice-weed (*Scoparia dulcis*). The term broom-weed is also applied here to the little tough-stemmed yellow mallows to be noticed presently, that grow along the road-sides.

The spurge are common weeds in these and all gardens. The most noticeable is an erect slender-branched plant a foot or two high, with narrow finely-serrated leaves and many axillary clusters of tiny white or pinkish flowers, generally mixed with the green or purplish rounded seeds, not bigger than a large pin's head. This kind is called milk-weed, fowl-tongue, or "man" dove-weed, and its milky juice is held to be good for purifying the blood. Under the name of the tutsan-leaved spurge—a translation of its scientific name, *Euphorbia hypericifolia*—it is dignified with a whole copper-plate in the last edition of the *Encyclopædia Britannica* as a type of its order. The small leaves of the spurges, almost like the pinnate leaflets of some of the leguminosæ, give a rather laddery look to the stems, which is most noticeable in the prostrate kinds. The dove-weed or red milk-weed (*Euphorbia pilulifera*), common everywhere, has minute olive green or reddish flowers and fruit crowded up the brownish stems, which are more often prostrate than erect. The tiny nutlets of this and the next kind are a favourite food of the ground doves common here. A still smaller and more creeping kind, with numerous pairs of rounded leaflets less than half an inch long, is the thyme-leaved spurge or dove-weed (*Euphorbia thymifolia*), common on the paths; and at least one other small prostrate kind is often found with it. An allied plant called Surinam bitters (*Phyllanthus Niruri*), about

the size of the first milk-weed, has drooping pinnate-looking leaves, suggesting a sensitive plant, and may be known at once by the minute globular green flowers and fruit being set along the stalks at the back of the leaves, which have to be raised to discover them. Perhaps for this reason it is used as a remedy for all pains in the back, much as the swollen and puffy capsules of the pop-vine seem to have suggested its use for dropsy.

Another common weed of the paths is the purslane, with fleshy stems and leaves, and yellow flowers, too familiar to need further description. This plant is so constantly spoken of in the books as "a well-known pot-herb," though no one ever heard of a dish of purslane, that I once as a scientific experiment had some boiled for a dinner vegetable. The result was a watery and inferior kind of spinach, and I agree with the guarded statement of an old writer on Barbados, that "it may be *boil'd and us'd* when no better Greens are in Plenty."

In moist parts of the avenue and elsewhere we shall see the small vivid blue blossoms of the blue pond-weed, puna-grass, or water-grass (*Commelynna nudiflora*), which has straggling grass-like stems and leaves, and three petals to the flower, the two side ones shaped like tiny scoops; it is sometimes called Demerara forget-me-not. Under the trees we may notice the erect fleshy purplish stems and scalloped succulent leaves of the leaf-of-life plant (*Bryophyllum calycinum*), which has a curious way of perpetuating its kind; the leaves are originally ternate, but some of the large leaflets drop off early, and if they fall on damp soil put forth marginal buds, which become perfect little plants long before the leaf has faded; hence it is sometimes called hen-and-chickens plant.

The common primrose willow (*Fusciaea crenata*) is a slender branching shrub, from a foot to six feet high, distinguished by its linear-lanceolate leaves and four-petalled yellow flowers about the size of a "bit," with one of the four points of the calyx showing between each petal; the stalks turn red as the plant matures. Two kinds of greater primrose willows are found near town, with flowers as big as a shilling, and elongated seed-capsules an inch to an inch and a half long; the largest kind (*F. nervosa*) is sometimes called yellow loose-strife.

At the top of the Gardens the common convolvulus or wild-potato (*Ipomoea fastigiata*) is frequent on the bushes, its flowers pale purple with a darker centre; and the creamy-yellow mima is generally in flower: in the trenches we shall see the leaves if not the flower of the large white water-lily, the little yellow blossoms of the blanket-weed, and generally the fine lilac spikes of the greater pontederia. On the dam of the Lamaha several noticeable flowers will be found without going more than fifty yards either way: the wild starch (*Heliconia psittacorum*), with its glossy glaive-shaped leaves and orange-red flowers, sheathed in bracts of the same colour and tipped with blackish marks: the red and yellow tassels of the wild coffee bush (*Palicourea aurantiaca*), formed by red flower-stalks and waxy yellow tubular flowers, which are succeeded by a cluster of purple-black berries: here and there the tall straight stems, with dull purplish foxglove-like flowers, of the strong-scented sesamum, zezegany, vanglo, or wangilla (*Sesamum indicum*)—more common on the Race Course road,—which produces the oily seeds called sesame, whose name opened the cave

of the Forty Thieves for Ali Baba : and two conspicuous white flowers, one the well-known wild jessamine (*Randia Mussændæ*), with the pointed lobes of its tubular flowers slightly bent to one side, suggesting the shape of a screw-propeller ; the other, the wild ginger (*Costus niveus*), with thick green stems, smooth undivided leaves, and large heads of green bracts, from which only one large hood-shaped blossom opens at a time, in a one-sided and rather disappointing fashion. Here too we shall find plenty of the bright red and orange verbena-like flowers of the sweet-sage or white-sage (*Lantana camara*), with strongly aromatic leaves ; it may be compared with the black-sage (*Cordia Aubletii*), common here and everywhere, which has narrow, less pleasantly aromatic leaves, and little spikes of whitish flowers, and is the best bush for making fascines for sea-dams ; a still more ornamental kind of sweet-sage (*Lantana biflora*), with pink or white flowers with yellow throats, is found in sheltered places lower down the Gardens. About twenty yards north of the seat under the bamboos we may often find the wild musk-ochro (*Abelmoschus moschatus*) in flower, with large bright-yellow hibiscus-like blossoms with a purple base, rough halbert-shaped leaves, and large capsules something like the common ochro. The wild heliotrope, turnsole, or white clary (*Heliotropium indicum*) can scarcely be mistaken by any one who knows the cultivated flower ; it has crumpled sage-like leaves and curved, flattened, and crowded spikes of very pale mauve or white blossoms ; it has not the pleasant scent that has gained the heliotrope at home the name of cherry-pie, but if presented with suitable expression it means "*I love you*" just the same

as in the old country. Everywhere on the dam we shall see the thin, twisted, purplish spikes of an allied plant, the common vervain, called here ver-vine and even bur-vine (*Stachytarpha nepetæfolia*), with a few small pale mauve blossoms on each spike; a rather prettier kind with blue flowers, but the same unconscionable proportion of spike to blossom, is the Jamaica vervain (*S. jamaicense*) less common here, but a weed in several places; for instance, by a most unlovely trench in New North Road, half-way between Camp Street and Waterloo Street.

On this dam we shall also find many plants already described, such as the rattle-wort, the yellow seaside peas, the sesban or swamp pea, the bitter tally, the bush flea-bane, the little heart-pea, and many others: besides several undescribed kinds, of which we will only mention the calabash tree, the wild guava, and a large swamp bush (*Anona palustris*), with dull yellowish and reddish flowers, succeeded by greenish fruits as big as an apple, known as the alligator-apple tree, monkey-apple tree, and corkwood.

On the road to the Kitty we shall see the sweet-sage and black-sage, the wild ipecacuanha, and the blue flowers of the minnie-root: but the commonest weed is the bush-mallow known as the jumbi ochro (*Malachra capitata*), something like a weedy hollyhock, with yellow flowers surrounded by curiously folded leafy bracts covered with viscid hairs, and straggling stems, growing six or seven feet long in uncleared spots. A white kind will be seen growing with it, with a more hispid growth and slightly stinging hairs, the white stinging mallow (*M. radiata*); they are not very attractive plants at any time, but are seen to most advantage in the morning, as

they close their flowers and begin to fold the leaves up the stem quite early in the afternoon. Two or three smaller yellow mallows or rather malvindas (*Sida rhombifolia* and others) are common roadside weeds: they have tough twiggy stems and narrow serrated leaves, but may be recognised as akin to the mallows by the small but characteristic yellow flowers, and the green stalked capsules, which somewhat resemble the "cheeses" picked by children from the pink and purple mallows at home. We have already noticed the name broom-weed given to them from the use they are sometimes put to; one kind that spreads on the ground with a humble prostrate growth is called the pray-pray broom-weed.

A stranger to the tropics may be interested to see the cotton bushes (*Gossypium barbadense*) growing here and there on the far side of the trench, and declaring themselves unmistakably by their bunches of white cotton-wool. The cultivation of cotton once extended all along the front lands of the coast estates, and was temporarily revived during the American war, and these trees are no doubt survivals from that time.

Arrived at the sands, whose only drawback is that they are apt to remind one too forcibly of Araby the Blest, or the breezes that blow soft o'er Ceylon's isle, from the unfortunate contrast they present; and noting as we step on to them the long "pimpler" spikes of the watchman plant and the dark serrated leaves and small white flowers of the wild senna bush or goat-weed; we shall probably notice first the smooth lanceolate leaves and bright yellow blossoms of a shrubby, partially twining bush called the wild physic-nut, (*Stigmaphyllum*):

each of the five petals, which have a wavy, almost fringed contour, stands somewhat apart from the others on a short stalk or claw, so that the flower cannot be mistaken for any other. Near it we shall find the conspicuous yellow papilionaceous flowers and ternate leaves of the seaside pea, trailing and twining in a thick bush. Another much larger papilionaceous plant, trailing but not twining, with big trifoliate leaves, long stout pods, and purple flowers, is the seaside bean (*Canavalia obtusifolia*), already mentioned. Its runners are mingled with the long trailing stems of the nanny-foot convolvulus or seaside potato (*Ipomoea pes-caprae*), whose rather heart-shaped leaves are cloven at the rounded end so as to present some resemblance to the foot of a goat; the flowers are purplish and rather large. Two other convolvuluses are found twining on the bushes instead of trailing on the sands: one resembles the common purple convolvulus or wild potato already noticed. This and the last are popularly named from their tuberous roots, akin to the sweet potato (*Ipomoea batatas*), itself a convolvulus not unfrequently found running wild; not from any affinity with the ordinary potato, which, as we have seen, is a nightshade. The other convolvulus is a large handsome kind called the morning glory (*I. tuba*), whose pure white blossoms, two or three inches across, are only to be seen expanded towards dusk or in the early morning. The seeds of this and the nanny-foot convolvulus are downy with a brown plush-like pile, and may be strung into necklaces, somewhat resembling, though much inferior to, those made by the Indians from the velvety seeds of the moorie (*Quinua guianensis*), sometimes seen in town.

Three or four kinds of the fleshy-leaved, succulent plants characteristic of the sea-shore will be met with here ; the one with pink flowers—the colour being really given by the calyx, for it has no petals—is the seaside purslane (*Sesuvium portulacastrum*). A weak, diffuse plant with small round whitish flower-heads, is a species of seaside everlasting plant or rupture-wort (*Alternanthera ficoidea*) : a larger plant, straggling among the bushes or rooting by runners, with almost cylindrical leaves like little pea-pods, and minute greenish-white flowers in short heads in the axils of the upper leaves, is the barilla or Jamaica samphire (*Batis maritima*) ; and a rather similar plant, common on the Kelly dam and further up the road, with white flowers in scorpioid spikes, grey-green glaucous leaves, and tiny nutlets for its fruit, is the sea-side heliotrope (*Heliotropium curassavicum*), also called wild lavender.

Among the higher flowering bushes here the commonest is the well-known courida bush (*Avicennia nitida*), with lanceolate leaves and small bunches of white or cream-coloured flowers, dotted with the dark projecting stamens, and generally mixed with already faded blossoms. There is no better plant than this for binding and preserving an exposed sea-shore, its roots everywhere penetrating the soil and sending up short upright processes, from which engineers might well have taken the plan of driving in stakes to break the waves upon a sea-front in shallow water. Here too we shall find the wild mahoe (*Paritium tiliaceum*), growing twelve or fifteen feet high, with broad rounded leaves curiously snipped into a short abrupt point at the end of the mid-rib, and large yellow flowers like an hibiscus ; and the seaside mahoe or poplar

tree (*Thespesia populnea*), with very similar yellow flowers shaded with purple, and handsome glossy leaves, heart-shaped at the base and pointed, and conspicuously marked with the light green mid-rib and veins relieved upon a darker ground. Both are good fibre plants, their inner bark furnishing a kind of bast commonly used by gardeners.

Here our botanical rambles round Georgetown must end for the present. If they have seemed somewhat tedious, I may remind my readers that they need not be taken all at once, as my notes are intended for reference rather than continuous reading. When I began this paper I hoped to be able to give a sufficient description of our commoner wild flowers to enable any one who had noticed them to recall their features as he read. But this soon proved impossible in the space at command, and the descriptions had to be cut down to a few salient points, sufficient in most cases to identify the species when gathered and examined with its congeners, though scarcely to suggest its appearance. These abbreviated descriptions have been taken direct from freshly gathered plants, and, trivial as some may seem, they may be depended on so far as they go. Thus, to take a specimen or two, a yellow papilionaceous flower profusely marked with blackish specks outside the standard is sure to be the sesban or swamp-pea; a grass-like plant with a small three-petalled flower of vivid blue must be the blue pond-grass or Demerara forget-me-not, and so on. Thus, if the necessity of writing a catalogue rather than a description has robbed the subject of much of its picturesqueness, I hope that it may have increased the usefulness of the paper to those who care to find out

for themselves the names of some of our most frequent wild flowers.

I shall be very much obliged to any reader who will add to, or point out any errors in, the collection of popular names here given: as with the exception of a few English names given in Grisebach, and in Dalton, there are no authorities to refer to on this interesting branch of the subject, which, after making allowance for the fact that certain names are generic rather than specific, is much more definite and precise than botanists would at first suppose.

Caracas as a Place of Resort.

By W. J. Smith, Commander, Royal Mail Steamer "Eden."

 HE travelling community and my friends in the West Indies have frequently asked information about Caracas and its desirability generally as a place of resort. The following few pages are intended to furnish concisely what might be interesting to those who are in search of change and rest within a convenient distance.

Our geographies tell us that Caracas, the capital of the province and the seat of Government of the Republic of Venezuela, is situated at the western end of the plain of Chacao, 2,880 feet above the sea level. It is seven miles from the coast as the crow flies, but the road to reach it is twenty-two miles in length. In 1883 it was said to contain a population of over 70,000.

After numerous visits to this capital I maintain that no more suitable or enjoyable place could be selected by residents in the West Indies in search of a change near at hand. The facilities which are now offered by the R.M.S.P. Co. to reach it and spend a few days should not be missed by those who are in need of rest, change of air, and complete separation from the ordinary routine of colonial life. The sea voyage from Demerara *via* Barbados and Trinidad *en route* to La Guayra, the seaport of Caracas, is in itself much to be commended. After leaving Barbados the passage need not be dreaded for the sea is always smooth, and the change of scenery from day to day breaks all monotony.

TIMEHRI.

On leaving La Guayra on Sunday morning one finds it possible to leave for Caracas conveniently at eight in the morning, and to arrive in the afternoon at three. The latter time is to be preferred since it gives a longer time to prepare for the night, and the day is greatly diminished.

The railway from La Guayra to Caracas is a wonderful engineering. It has a narrow gauge of three feet, but in some respects it much resembles the line from Mexico City to the city of Mexico, which, at a distance of 100 miles from the coast, ascends to a height of 8,000 feet, the gradients being about 1 in 27. The Caracas railway was built by English engineers in 1884, and the work was completed in two years under the guidance of Messrs. ~~and~~ & Co. To the credit of the present management it can be said that no loss of life, nor any serious accident of a serious nature, has occurred. To convey some idea of the character of the railway it may be stated that the line is at places carried along a ledge cut into the perpendicular rock, some 3,000 feet high, and that if the carriage would fall it would not touch the ground. The curves of the line are very sharp, and at times the engine appears to be running into another train coming in the opposite direction.

The scenery between La Guayra and Caracas is superb, and the journeys through wonderful mountain passes, with the road opening out at every turn. The magnificence of the country is better seen on the way down from Caracas, when the whole view is then enchanting in the extreme. The station, or depot, at Caracas is large and imposing. The unwary traveller, on his arrival, is at once surrounded upon by the natives for the exclusive right of

running off with the hand baggage, but if they are firmly remonstrated with, they are civil enough and cease to be aggressive.

There are always plenty of carriages at hand to convey visitors to the hotels. These carriages are each drawn by two sturdy little horses which travel along over rough stones, pits and boulders, in a most remarkable manner. The vehicles are lightly made with good springs, and are well equipped; and both driver and beast are well found, the former being civil and obliging. Cab hire is necessarily expensive, about two shillings a mile. There are, however, tramways intersecting the city, which run throughout the day, and late at night, the fare for any distance being five cents.

When one visits a new place, and intends remaining a few days, the question naturally asked is, "What are the hotels like?" In former times, and until lately, the hotels of Caracas were its great disappointment; they were of the worst description, and there was not a single modern comfort attached to them. Happily, however, the great influx of visitors, chiefly Americans, and the demand of the better class of Venezuelans, have altered this, and now the hotels "St. Amand" and "Americano" are good enough. The latest and best hotel is the "Grande," just completed, and fitted with every convenience, the bath and sanitary arrangements being perfect.

The attractions of the city are numerous. The public gardens, over which is the "Paseo del Calvario," are pleasantly situated, tastefully laid out and planted, and within easy walking distance of the stations and hotels. On Calvario was, until quite recently, the finest statue of

General GUZMAN BLANCO, the late President of Venezuela ; but his enemies, a few days ago, pulled it down, and the spot is being prepared for the figure of the country's future ruler, whoever he may be.*

To attempt to describe scenery for the intending tourist is, I think, a mistake. It will be sufficient in a few words to say, that one may travel a long way to find the view from Calvario surpassed. One gets lost in contemplation of such a sight, the city being not unlike many in Spain, and with its quaint churches and flat red-roofed dwelling-houses lying in a hollow. The mountain landscape surrounding the city is in itself perfect; and the scene is one of those the effect of which one feels rather than wishes to describe.

There is a fine plaza called Bolivar, after the liberator and regenerator of the country, SIMON BOLIVAR ; and in the centre of this plaza is a monument, in ever grateful memory of this great hero. On special evenings, the plaza is crowded with the élite of Caracas society, and a good band plays. The surroundings, faces, language, all are Spanish ; and one quite forgets for the time that he is not in some Spanish city, and that he is but a few miles away from his home in Trinidad or British Guiana.

If the question were asked, "For what is Caracas famous?" I should unhesitatingly say, "For its pure air." The average temperature is 71° , the highest recorded in midsummer is 82° , and it descends in winter to 52° . The best time for making a visit to the country is from December to April.

The museums of Caracas ought not to be left

* Senor Raol Paol has been recently elected President.

unvisited. Dr. ERNST, the present Librarian and Curator, is always anxious that visitors should inspect the National Collections. The room set apart for the relics of SIMON BOLIVAR, and other worthies, is as jealously guarded as NELSON'S in the Painted Hall at Greenwich. The University, the Hall of Congress, the National Gallery, the Mint, and the "Panteon Nacional" are all fine buildings. In the latter SIMON BOLIVAR is buried, and near at hand rest the remains of several English and Irish officers who fought against Spain for Venezuelan Independence. The National Gallery contains a painting, "The Signing of Independence," by a native artist. This, which is a work of some merit, will bear much inspection, and has been favourably commented upon. The Mint, organised by GUZMAN BLANCO, is comparatively a new institution, and is under a perfect system. For those who have never visited a coin-making establishment, the Mint is well worth the undertaking. The Venezuelan coin is exceedingly pretty.

Caracas boasts of two theatres—one small, and the other styled the "Grand Teatro de Guzman Blanco." The latter is chiefly used for the opera, and the Government gives a subvention to attract troupes from France and Spain. It is a large building, well adapted for the climate, and tastefully decorated. On a full night one might fancy that one is in a similar place of entertainment in Europe. The Amateur Philharmonic Society generally uses one or other of the theatres, when the opera season is over, for their concerts; and admirable concerts they are. Many of the artistes show what the Conservatoire in Paris and other places have done for them in training them efficiently.

The city also contains a Bull Ring, and once a week this is generally in full swing. It is patronised principally by the lower classes.

I visited it once, just to say that I had seen a bull fight. I shall not readily forget the sight. In a large building, some eight or nine hundred people had assembled. After frantic impatience on their part a bull came bounding into the ring, looking wildly around for a victim to gore, or something to eat. I believe the latter, for it really looked very famished. The minor actors in the fight were not long in putting in an appearance, and then the battle commenced. It seemed to me that the attacking party, five in number, were new to the business, or afraid of pushing matters too far, for they approached the bull with great consideration. Now and then the more venturesome would manage to get their dart in somewhere, and then dart out somewhere leaving their red flag in the ring for the animal to inspect. This byplay after a time made the bull furious, and the audience vexed: there was a demand for the "Matador," and that great man made his appearance, being received with yells of wild delight, which astonished the bull and restored his senses. It was now to be a single combat between man and beast; the latter had rested, and was ready for his new antagonist; the man seemingly equal to the occasion. As the fight waxed fast and furious the excitement of the spectators kept pace.

It was a long struggle, or it seemed so to me, but matters were at last coming to a crisis, man or bull must fall; if the former there would be more excitement.

To relieve suspense and the general quietness which prevailed, a god in the gallery cried out in Spanish,

"Keep up, *hombre*, don't be afraid, treat him like you would an Englishman!" This caused considerable mirth; and I was anxious to see if the suggestion of the gods' representative would be carried out, and how. I was not long kept in a state of uncertainty. The Matador regained strength and courage, and the bull received what was supposed to be his death blow, a huge stab in the neck, really a stab given in the dark. The animal fell exhausted, and the hero of the day ran out of the arena.

GUZMAN BLANCO in a decree prohibited the bulls being killed in the fight, they are only to be stunned, and afterwards slaughtered in the usual manner. I suppose it was meant as an act of mercy.

The English, at the time of which I write, 1886, were in the height of disfavour with the Venezuelans. The vexed question of "Boundary" between Venezuela and British Guiana had again come to the front. There were also matters of a grave nature between Trinidad and Venezuela, the former, or the Government at home, demanding an indemnity for injustice done to subjects and their property. Three British Men-of-War, the *Comus*, *Emerald*, and *Lily*, were at anchor in La Guayra roadstead ready to enforce these demands, either by seizing the Custom House, or bombarding the town, and, rumour had it, if necessary, throw a shell into Caracas. Diplomatic relations with England had ceased, and the British Minister safe on board the *Comus*. These were disquieting times for English visitors to Caracas; nevertheless, one heard little of these disputes talked over in society. The majority of the merchants had sufficient trouble of their own near at hand to concern them and their prosperity.

The President was grasping, the taxes were excessive, and enterprise, like the railway, all up-hill work. A few outside differences, to the merchants, did not matter much, probably they cared less; and our god in the gallery likely enough felt his country's wrong more keenly than his betters.

While describing the various sights of Caracas, the Cathedral and other places of worship must not be overlooked. They are generally crowded in the early morning. The Venezuelans are Catholics, and hear Mass and go to Confession. Their churches are kept in good repair, the priests are charitable, and the poorer classes have bread, as well as religion, doled out to them.

The private residences of the wealthy are well built, adapted to suit the climate, and fashioned after the Spanish style, with flat roofs and with rooms large and airy; a court-yard, generally well stocked with plants and flowers, separates the bed-rooms from the day-rooms.

The Douche Baths, near the station, have become quite an institution in the city. They are greatly in demand by visitors, and the better class of residents, after the early morning coffee—and such coffee! The Venezuelans must have taught themselves the art of producing the finest results from the berry which is cultivated in the country, and so justly famous in most parts of the world.

The suburbs of Caracas are but few, and better seen from a distance. Antimone is by far the prettiest. Here the President has a country seat, the large gardens of which were laid out under the supervision of Madame GUZMAN BLANCO, who, with her two daughters, took the greatest interest in all the surroundings of their retreat, and were the means of making that retreat so charming.

Before taking leave of Caracas, a few particulars must be given respecting time, and other matters of importance relative to the journey to the capital and back—information which will be useful to residents in the West Indies.

A visitor from Demerara leaving by the Inter-colonial Steamer, *via* Barbados, would, at the shortest, be away from the colony a day less than three weeks. I calculate that the expenses, including return passage, incidental expenses on the voyage, and three days' stay at Caracas, would amount on the average to a little over £1 a day. From Trinidad, individual expenses would be, for the seven days' away, a trifle more per day, and from the Northern Islands the same as from Demerara. It may be mentioned that passports are no longer needed.

There can be no reasonable demur brought against these charges as being extravagant or excessive, probably they are far less than the ordinary run of daily expenses on shore.

With government officials there is another consideration, and that is the question of leave. Many officials say "If I take three weeks' leave in the year it counts against my long leave which I am entitled to after so many years' service." That may be so. But what is three weeks' leave in the year after all, out of the four, six, or, it may be twelve months' leave to which the official is entitled? Granted that such an one has worked hard day by day for two or three years, and then returns to England to enjoy his leave. Is it generally all enjoyment? Or it may be that he has had no change of air, or pursuit, for a very long time and then returns home in failing health, with a liver out of order, or

returning in a multitude of ways. The first period, at any rate, of such leave at home, is generally occupied in consulting specialists. Medical bills he finds heavy, and they have to be met; and it is only after a month or two that he 'feels fit.'

A change in time, and at the right time, is certainly the only thing necessary; and the old story of prevention being worth so many ounces of cure, is as good, in our time, and in the tropics, as ever it was.

A trip to Caracas offers special advantages and, without doubt, improves both body and mind.

IN MEMORIAM.

E. E. H. Francis, died Saturday, August 31st,
1889, aged 38.

(See Minutes of the October Meeting of the Society.)

D. C. Cameron, died Saturday, November 9th,
1889, aged 50.

(See Minutes of the November Meeting of the Society.)

Report of the Meetings of the Society.

Meeting held on the 11th July.—G. H. Hawtayne, C.M.G., C.M.Z.S., F.R.G.S., President, in the chair.

There were 10 members present.

Elections.—*Members* : Messrs. C. L. Payne, R. B. Pratt, and Col. the Hon. R. S. Cotton.

Associates : Messrs. A. W. Swain, N. B. Winter, R. J. Ferguson, T. H. K. Moulder, Edmund Jones, and E. A. Jackman.

The Chairman read a Report from the Agricultural Committee, on the project of Mr. Gieffers for establishing a large Starch Manufactory in the colony, recommending the Society to encourage the formation of a Company to carry out the plan, and also to grant a bonus of \$500 for the first shipment of 50 brls. of starch grown and manufactured here.

Mr. Cameron, in moving the adoption of the Report, spoke in favour of the project, but as Mr. Gieffers had already left the colony, the matter was allowed to drop.

The Chairman informed the meeting that the Directors had filled up the vacancies in their body caused by the absence from the colony of Messrs. P. H. Nind and M. Garnett, by Messrs. Jos. Monkhouse and Ferris Grant.

The Chairman stated that he had received a letter from Mr. Luke M. Hill, resigning his office of Honorary Secretary on account of his being about to leave the colony on the 20th inst., at the same time stating that he was unavoidably prevented from attending the present meeting.

Mr. D. C. Cameron, in proposing the acceptance of

Mr. Hill's resignation as from the 20th inst., wished also to propose that a vote of thanks be given to Mr. Hill for the able services he had rendered to the Society. He had taken the appointment of Secretary at a time when there was a great difficulty in filling the office, and he was very sorry that they were about to lose his services. At the same time he felt sure that he only re-echoed the feelings of the other members of the Society in saying that he hoped his trip would be a pleasant one, and that they would be only too glad to welcome him back again.

The vote of thanks was cordially and unanimously adopted, and the question of appointing an Honorary Secretary laid over.

Mr. Cameron gave notice of motion to the effect that

"The Meetings of the Society shall be held in the Reading Rooms instead of the Exchange Room, in future."

Mr. N. Darnell Davis gave notice of motion as follows:

"It is desirable that the best route for connecting British Guiana with Trinidad by cable should be authoritatively ascertained.

"This Society therefore respectfully requests His Excellency the Governor to take such steps as to His Excellency may seem best, to induce the Imperial Government to cause a Hydrographical Survey to be made of the bed of the sea lying between the two colonies, so as to obviate the numerous interruptions to telegraphic communication with other countries from which British Guiana has hitherto suffered."

The Chairman read a letter from Major Walthall covering a communication from the U. S. Department of Agriculture, as to tropical productions and fruits. A pamphlet, "Report on Tropical and Semi-Tropical Fruits in the U.S.," had also been forwarded, from which the Chairman read several extracts as to bananas, oranges, avocado pears, and mangoes.

The thanks of the Society were given to Dr. Landré of the Hague for copies of two pamphlets on Leprosy.

The venerable doctor, who was now eighty years old, had for many years believed in the propagation of Leprosy by contagion, as one of the pamphlets shows by its title, "De la Contagion seule cause de la propagation de la Lèpre."

Mr. Quelch exhibited a very large stone implement or adze which had been lately bought for the Museum; and related that its late owner, who had represented it to have been a "thunderbolt," had given a characteristic story of its having fallen when a girl had lately been killed by lightning; it had been taken from a trench in Charles-town.

The meeting then terminated.

Meeting held on the 8th August.—G. H. Hawtayne, C.M.G., C.M.Z.S., F.R.G.S., President, in the chair.

There were 12 members present.

Elections.—*Members*: Messrs. J. H. Burgess, S. R. Cochran, and J. W. Dorman.

Associates: Messrs. J. M. Moncrieffe, Veerasawmy, J. Cadle, and J. H. Smellie.

The election of Mr. S. A. Campbell was deferred for enquiries as to salary, to determine his election to associate or full membership.

Mr. R. J. Kelly, who, until the arrival of the President, acted as the Chairman, informed the meeting that Mr. Thos. Daly had been elected Honorary Secretary by the Board of Directors, and had kindly accepted the office.

The President informed the meeting that Mr. E. F. im Thurn had been proposed by the Board of Directors

as an Honorary Member, and that the nomination would be brought up at the next General Meeting.

The Secretary read a Report from the Committee of Correspondence, stating first, that the proposed Exhibition at Buxton had been abandoned owing to the lack of interest on the part of the persons for whose benefit it had been intended ; and second, that the money voted by the Combined Court would be retained in hand towards the next Central Exhibition in Georgetown.

The President proposed the adoption of the Report, which was seconded by Mr. Geo. Little, Jnr. As an amendment, it was proposed by Mr. N. D. Davis, and seconded by Mr. W. Cunningham, that the Committee of Correspondence be requested to reconsider the matter, especially in regard to the latter portion of the Report, as an Exhibition in another part of the colony might be more successful.

Mr. Cunningham said that something might be done now that Mr. Daly who was well known to feel an interest in the matter had come back.

Mr. Daly said if the people of Buxton were foolish enough to refuse, some other village might be more sensible.

Mr. Davis' amendment having been duly carried, the matter was ordered to be sent back to the Committee of Correspondence with a view to an Exhibition being held in some other locality.

The Secretary read a Report from the Chamber of Commerce, on the matter of Food Analysis, which had been referred to the *Commercial Committee*. They were of opinion that the fee should be reduced to \$2.00, and recommended increased vigilance on the part of the officers on whom the inspection of foods devolves.

In the absence of Mr. D. C. Cameron, the motion of which he had given notice, was brought forward by Mr. N. D. Davis, "that the Meetings of the Society be held in future in the Reading Rooms." Mr. Davis thought the old place of meeting better suited for the purpose than the Exchange Room, and he thought the hour of meeting might be changed with advantage. Mr. Vyle seconded the motion, which was carried unanimously.

It was then moved by Mr. Turner and seconded by Mr. Vyle, that the Meetings of the Society be held in future at 4 p.m., instead of 3, which was duly carried, the President remarking that the present time of meeting had been chosen for the accommodation of gentlemen from the East Coast, but as hardly any of them came to the meetings, it would be more convenient to change the time.

Mr. N. D. Davis brought forward his motion, of which due notice had been given, that the Society move that a Hydrographical Survey be obtained for telegraph purposes, of the bed of the sea between British Guiana and Trinidad.

Mr. Davis spoke of the unsatisfactory state of our cable communication, which he believed to be due to the formation of the sea bottom, and if such a survey could be obtained it might be very useful in showing the best place to lay the cable and perhaps lead to a better state of things.

The motion having been seconded by Mr. Daly, it was carried unanimously.

The Secretary read a letter from Major Walthall conveying a communication from M. F. Gonzalez, Pensacola, in answer to the Society's request for information as to

the best kiln for drying Indian Corn. It was considered more desirable in the United States to dry the meal rather than the grain, for which purpose Cutter's Steam Dryer was recommended.

The thanks of the Society were given to Major Wal-thall for his kindness in trying to procure the information, and that gentleman said he had taken steps to procure further advice on the same subject.

Mr. Turner mentioned that the descriptions of Corn Kilns could be procured from the United Kingdom, and described a very simple method of drying corn on a wire cloth over a clear fire. He considered that we ought to grow all our corn, rice, and tobacco, but as the case is at present he was obliged to pay 50 cents per barrel more for creole corn than for that which comes from the United States.

The thanks of the Society were presented for the following donations :—

Government of British Guiana	...Report on Fibre Industry,
Do.	...Blue Book, 1889.
Canadian Institute ...	...Proceedings.
W. Tebb ...	...Jenner and Vaccination.
Dr. Macnamara ...	...Transactions of Sanitary Insti-tute, 2 vols.

Mr. Turner, having been asked for information concerning the new Alcoholometer which had lately been adopted by the Commissary Department, gave a short account of the mechanism of the instrument. By it thousands of gallons of rum could be measured with the greatest exactitude, and not only so but at the same time the strength was indicated so as to be beyond dispute. The reason why it had not been adopted in the United Kingdom was because the system in use there was so

perfect already, that unless some gain would result, the authorities did not care to make great alterations. In this colony, on the contrary, there had hitherto been no system, and there was less trouble in introducing the instrument in question than the elaborate excise system of the United Kingdom.

A vote of thanks was accorded to Mr. Turner for his explanation.

The meeting then terminated.

Meeting held on the 19th September.—Mr. R. P. Drysdale in the chair.

There were 12 members present.

Elections.—Member: Mr. S. A. H. Campbell.

Associate: Mr. Matthew French.

The Secretary intimated that the following donations had been received towards the extension of the Museum:—The Colonial Company, \$120; Messrs. Sandbach, Tinne, & Company, \$100.

On the motion of Mr. Vyle, seconded by the Hon. C. P. Austin, a cordial vote of thanks was given to the donors.

The Rev. W. B. Ritchie asked whether the present meeting was the proper place to make a motion, that all "new books" be laid on the table for seven days before being lent to the members.

The Chairman replied that the proper course would be to bring the matter before the Book Committee, from which it could be referred to the Directors.

The Secretary informed the meeting that he had written to the Committee of Correspondence on the

matter of the Country Exhibition, but had not yet received any reply.

The Secretary read a letter from the Government Secretary, in reference to the motion passed at the last meeting, as to the suggested Hydrographical Survey of the sea bottom between this colony and Trinidad, stating that, "The question of telegraphic communication between this colony and abroad has for some time been engaging the attention of this Government."

The Assistant Secretary read the following short analysis of the report of George Preston, Esq., the Commissioner from the Bahamas to enquire into the working of the fibre industry in Yucatan. The report being too long, it had been suggested that a *résumé* would be interesting.

Abstract of Report on Sisal Hemp,

The development of the Sisal Hemp industry in Yucatan has been very rapid. It was started about 1873, and as early as 1880 the shipments amounted to 97,351 bales of the value of eighteen hundred thousand dollars, while last year the amount was 213,882 bales, of the value of \$6,641,257 69. There are in Yucatan about 200 farms of different sizes, the largest employing 30 fibre machines and 500 hands. The profits of some of the farmers amount to \$500 to \$2,000 per day, the fibre giving a net profit of 9 cents per lb., and as a natural consequence there has been a considerable increase in the prosperity of the country.

The poorest land can be utilised for this plant, a sandy soil that is otherwise worthless being most suitable. The only preparation needed is clearing the land, which is not very difficult, as the poorest land is necessarily easiest to prepare, the Report giving the cost at 35s. to 40s. per acre. The usual mode of propagation is by suckers, which grows from the old plants, and produce leaves fit for cutting in about 3 years. It is recommended that the young suckers be planted in rows at 6 feet distance from each other, with a distance of 11 feet between the rows to allow the cutters to work conveniently. The time for cutting will vary according to circumstances, the leaves ripen at different times and it

would be best to cut once in about three months, although an annual crop is possible, but not quite so good, as a better selection can be made at short intervals.

The fibre machine in use seems to be a very good one. It is made by Death and Ellwood of Leicester, and has been in use long enough to have a fair trial, in some cases as long as twenty years. It consists of a wheel of 50 inches in diameter and 8 inches broad on the face where are 8 knives or scrapers. Any number of machines may be provided and driven by a steam engine. Two wheels may be fed by a boy, and the fibre removed to the drying grounds by three men. Each wheel cleans 20 leaves per minute or 8,000 per day, the produce in fibre being about 5 per cent. of the leaves used. No water is used, so that after drying for two hours the product is fit for baling. The cost of the fibre is estimated at about $2\frac{1}{2}$ cents per lb. in Yucatan, but the reporter thinks that expenses would amount to about 3 cents in the Bahamas. In the local market at Merida it fetches about $10\frac{1}{2}$ cents and in the foreign markets 11 or 12 cents, showing a profit of 200 to 300 per cent. It must be understood that these estimates refer to a large plantation with 20 to 30 wheels continually at work, and it is natural to suppose that smaller farms would have larger expenses in proportion. The principal farm cleaned daily 48,000 leaves or 72,000 lbs., from which 3,600 lbs. of fibre was produced.

The Commissioner recommends for the Bahamas, a Central Factory, to which the peasants might bring their leaves, as it would be impossible for any but a very large grower to keep the machinery continually working. To keep 6 wheels going daily, it would require 600 acres of plants. The average annual produce of one acre being 19 tons of leaves or 18 cwts. of fibre; the value of this piece of land would be something like \$200, from which, after deducting labour, wear and tear of machinery, and other expenses, it would certainly appear that fortunes could be easily made in this cultivation. The cost of weeding and cutting would be very little, carriage to the central factory might give some trouble, but taking everything into consideration there must be a profit.

The Commissioner also went to Cuba where he found an English Fibre Company commencing the cultivation of *Agave Americana* and *Sanseveira*, but no results are forthcoming as yet.

The matter is a very important one. If it could be taken up in this colony, we have thousands of acres of sand reefs that could be utilised — land that is otherwise useless, while the plants are easily obtainable.

The Chairman considered the fibre industry to be a matter worth taking up by the people of this colony, especially when it is considered that there is plenty of land here which is not adapted for either sugar or rice. He did not expect the profits would be as great as stated by Mr. Preston, but it would be quite satisfactory and very encouraging if they should be even half as much as was stated in the report.

Mr. Jacob Conrad spoke in favour of the industry and gave notice of motion, "That the Society approach the Government, asking that provision be made for an experiment in sisal hemp cultivation, with a view to introducing the industry into the colony."

A vote of thanks was accorded to Mr. Rodway for his summary of the Report.

The Chairman stated that Mr. E. F. im Thurn had been proposed as an Honorary Member by the Board of Directors at the last meeting of the Society; it now remained to them to elect him. It was not necessary to say anything about Mr. im Thurn, as they all knew him so well, while, as they all knew, his services to the Society had been of considerable utility.

The Hon. C. P. Austin spoke in favour of the proposal, and Mr. Davis thought it a reproach to the Society that this matter had not been thought of before.

Mr. im Thurn was then duly balloted for and unanimously elected an Honorary Member of the Society.

The meeting then terminated.

Meeting held on the 17th October.—G. H. Hawtayne, C.M.G., C.M.Z.S., F.R.G.S., President, in the chair.

There were 17 members present.

Elections.—*Associates*: Messrs. T. S. Hargreaves, Thos. Barklie, L. Colvin, F. E. Warneford, and W. A. E. Dalzell.

The President stated that since the last meeting Mr. E. G. Barr of London had kindly presented a donation of £100 towards the refitting of the Museum.

On the motion of Mr. Davis, seconded by Mr. Daly, a very hearty vote of thanks was accorded to Mr. Barr.

The President said that as Mr. Jacob Conrad was not present to bring forward his motion as to Sisal Hemp cultivation, he was afraid this interesting and valuable matter must fall to the ground.

A specimen of the leaves of Agave (which, if not the identical plant, was commercially as useful), together with the fibre, was exhibited to the meeting.

The President referred to the loss to the Society, as well as to the colony, by the death of Mr. E. E. H. Francis, the late Government Chemist. Mr. Francis had helped the Society in many ways; none of them could forget his lectures before the Society, or his valuable contributions to *Timehri*. He thought they would agree with him that the colony had suffered an irreparable loss. It would be very difficult to find a man of like skill to come here and fill his place. Above all, he was most conscientious in his work, and his honesty and skill were shown by the fact that his polarisation certificates for immense shipments of sugar had never been disputed. They would be very remiss in their duty if they did not record on the minutes some expression of regret at the loss the Society had experienced.

Mr. Conyers called attention to a matter which concerned him very much as Treasurer of the Society. The

Government had granted the Society a sum of \$1,000 for the purpose of holding a Country Exhibition, and owing to the carelessness and opposition of the people for whose benefit the project had been attempted, the matter had been abandoned. They had spent about \$180 in advertising, printing, &c., and he wanted to know what should be done with the balance. He did not see any chance of getting up an exhibition in the rural districts, and, therefore, the specific object of the grant having fallen through, he thought the Government should be asked to allow the money to be used for some other object, or else they must return it. He had no motion to make, but simply wished to clear himself of the responsibility. The time had however arrived for another Biennial Exhibition or a Horticultural Show, and the sum in hand, supplemented by something more, might, with the consent of the Government, be used for either of these purposes.

In reply to Mr. Davis, the Secretary stated that he had written to the Committee of Correspondence on the subject of an exhibition in another district, but had not as yet received any reply. He would write again, as he should not like to see the matter shelved, but nothing could be done until the Committee decided. In the meantime he thought the money was in good hands, and the Society ought to hold it until it is settled whether a trial shall be made on the West Bank or West Coast.

Mr. Conyers said that what Mr. Daly stated was very well, but he nevertheless thought an explanation was due to the Government, in which the President concurred.

Mr. Mackay spoke in favour of having another Biennial Exhibition, and also suggested the desirability

of the colony being represented at the Great American Exhibition of 1892.

Mr. Davis spoke of the want of Local Secretaries, and Mr. Conyers said that Mr. Jones and Mr. Bascom had taken a great deal of trouble in trying to bring about the Exhibition at Buxton.

Mr. Turner said that corporate bodies generally were not so conscientious, but the question was a very simple one. The opinion of Mr. Conyers was the right one, some representation should certainly be made to the Government.

After some slight discussion, the Secretary undertook to procure a decision before the next meeting, by calling together the Committee of Correspondence. Mr. Daly stated that the principal reason for delay in this matter had been the illness of the Chairman of that Committee.

Mr. *Æ*neas Mackay gave notice of motion as follows :

That a Horticultural Exhibition, to include exhibits of preserved fruits, as well as those in the natural state, be held early next year, under the auspices of this Society, and that the Government be requested to support the movement by a grant of money.

In the absence of the author (who was unable to attend) the Secretary read the following paper by Mr. W. P. Abell, a late Whitworth Scholar, on "Economising Sugar Carriers:"—

ECONOMISING SUGAR CARRIERS.

Little drops of water are as necessary to the mighty ocean as successful waste saving inventions are to the commercial prosperity of a people. As sugar manufacturers we know well that our own is held, not by the adoption of one radical improvement, but by many economies in waste such as sugar, labour, fuel, &c.

To-day I beg to bring to your notice a simple but effective apparatus for carrying sugar from the centrifugals to the sugar bunks without waste or damage, and with a minimum of attention.

Both before and after my arrival in this colony, my attention was

often drawn to the wasteful, and unsatisfactory working of band and screw conveyors, and this led me some years ago to take the matter up with the idea of getting over the difficulties that presented themselves.

1st. In the case of band, these arose from its total unfitness, in spite of complicated brushes and cleaners, to carry and deliver the moist, and often hot, and sticky Demerara sugar.

2nd. There was no arrangement to clean out and liberate either the solid or helical screw, which often became clogged and choked, triturating the sugar, and necessitating its being dissolved and cleaned with hot water, and sometimes the removal of the whole apparatus from under the centrifugals, at a delay and expense that often prevented its being again replaced.

3rd. Molasses sugar, through its stickiness, cannot usually be carried even by helical screws, hence the whole apparatus had to be hauled from under the centrifugals.

4th. Molasses or water could fall through the centrifugal basket when standing on to the screw or band, thus making the sugar lumpy or sticky.

A brief explanation of the photographs will show you how these difficulties are overcome. The sugar discharged through the centrifugal basket bottom falls on to the hollow screw which conveys it to the elevator or bunk. The trough shown can partly revolve on pokers, the withdrawal of which allows one side of the trough to fall to the ground.

This exposes the screw and liberates the sugar instantly, see photo. No. 130. By raising the box and inserting the pokers again the apparatus is ready for work as shown on photo. 129. All this can be accomplished without either stopping the machines or conveyor. The light tray to prevent the molasses or water falling on to the cured sugar is pushed in by the operator's foot when the machine is not discharged, and drawn out when emptying the centrifugal. The arrangement of trough shown by the photographs is for two, three or four machines; for more, another style, with the sides and bottom partly or wholly removable, is used.

In long ranges of centrifugals where it is necessary to cure two quantities of sugar at the same time, I have arranged either right or left hand or double screws in one trough divided by a partition, which on being pushed over delivers the sugar from each machine into one or other of the conveyors as desired. The requirements here render it unnecessary for me to explain this. But those interested will find a detailed

description in any of the patent specifications of this invention. The advantages of this carrier are briefly :—

1st. If the sugar by any means clogs the screws it can be cleaned in an instant, and that without stopping either the machine or screw.

2nd Facilitating the cleaning of the screw when the curing is finished and the machines stopped.

3rd. It does not damage or triturate the sugar.

4th.—Molasses sugar cannot usually be carried by conveyors, hence the arrangement for instantly lowering the trough to form a *back* for the men to shovel against when putting the molasses sugar into casks, as shown by the photograph No. 130, so doing away with the necessity of hauling out the conveyor and trough, thus saving no inconsiderable expense and trouble.

5th. The prevention of molasses or water falling on to the cured sugar through the centrifugal baskets.

6th. The entire prevention of waste, both of sugar and labour, by needing no attention whatever, except in occasionally lowering or opening the trough for cleaning when required.

7th. It is thoroughly substantial and reliable, and I learnt, has never given any of the trouble so invariably experienced with other conveyors.

In conveying some 3,000 tons of sugar on the two first estates which adopted this conveyor, no difficulty whatever has been experienced. I also learn from the sole English makers for the British Colonies, Messrs. G. Fletcher & Co., London, that the few already made by them have given every satisfaction.

There is no doubt that the method of delivering into the bunk with the apparatus shown, effects a not inconsiderable saving in wages, besides the *cleanliness* resulting from preventing the sugar being *trampled* and destroyed *under-foot*. It was simply the conveyor difficulties already explained that prevented the adoption of mechanical sugar carriers long ago.

A vote of thanks was accorded to the author, but the discussion was postponed until next meeting, when Mr. Abell was expected to be in attendance.

The Secretary read the following communication from Mr. J. P. Stelle, of Mobile, U.S., in answer to a request of Major Walthall, on behalf of the Society, for infor-

mation as to "Kiln-drying of Indian Corn" and "Rice Culture":—

In reply to yours of 19th ult. I would state that there is no such thing in the United States as kiln-drying of Indian corn (*maize*) previous to grinding, or at any other time. If such a thing is necessary in British Guiana, it must be due to some peculiarity of climate. Here our corn ripens and dries on the stalk, and so soon as dry enough to be easily shelled from the cob is ready for the mill, into which it may be passed directly without any previous preparation. Meal made for long shipment, as from our Northern to our Southern States, and expected to be on hand for a considerable length of time, is usually kiln-dried after grinding, which causes it to keep longer. This meal is not regarded with so much favour as is the undried meal, hence our meal is most commonly ground in mills of the regions where it is to be consumed. In the non-corn-producing districts the corn is shipped from the corn countries to the mills.

Meal is kiln-dried by a very simple steam-process, which I could describe to you but suppose it would be of no interest to the Royal Agricultural and Commercial Society of British Guiana.

The only kiln-drying of corn ever done in this country is performed on green corn ("roasting ear") preparing it for keeping as an article of commerce when green corn is out of season with us. It is for use in the kitchen as green corn, and the drying is done by the usual methods of evaporating, with evaporators, on the same plans as those employed for evaporating fruits, etc. Sugar corn is the only variety evaporated, and the State of Maine sends out about all the evaporated corn consumed by the people of the United States.

The cultivation of lowland rice, as practiced in the United States, is extremely simple. The first essential is low and level land with a water supply sufficiently above it to admit of flooding at will. A low dike or levee is raised around the plat to hold in the flooding water when let on, and if the land is naturally too wet to admit of ploughing and pulverization, it is drained by open ditches running through it and discharging outside the dike. The ground to be seeded is thoroughly broken and deeply pulverized with the harrow. Here we do this in early spring, to get our crop through before the fall frosts, as it takes rice from five to six months from the seeding to attain to maturity. The seed is thinly sown in drills from eighteen to twenty inches apart. One bushel of seed ("rough rice") is considered enough to sow one acre.

It must not be crowded, as rice is a wonderful plant to stool, a single seed producing from ten to thirty and often more stalks. If sown with a good seed drill the necessary covering is secured at the same time, otherwise we cover the seed by some other means, to the depth of from one to two inches.

No further attention is called for until the young plants are up eight or ten inches high—then it becomes necessary to destroy the grass and weeds that are also springing up and choking the crop. This is done by flooding the fields. All drainage outlets are closed, and water is let on until it stands nearly at a level with the tops of rice. If, on account of irregularities in surface, portions of the field must be so deeply flooded as to bring the rice entirely under water, no harm comes of it. The water is left on about one week, possibly a little longer; or, in other words, till it has drowned out and destroyed the noxious growths, they not being able to endure such protracted inundation. The rice is not at all injured by the water. When it is seen that the grass and weeds have succumbed, the drainage outlets are opened allowing the water to run from the fields.

The rice now soon takes full possession of the ground, and thereafter becomes its own protector, in most cases, but if this happens otherwise, and the pest growths again appear (which seldom occurs), a second flooding becomes necessary to destroy them.

About the time the rice is beginning to head, the water is let on as an irrigation, but allowed to remain only some twenty-four hours. In seasons of extreme drought it is sometimes necessary to irrigate before this period in the growth of the crop, the need being made known by a yellowish and unthrifty appearance of the plants.

Harvesting the rice crop does not differ materially from that of most other small grains. Our planters usually cut it with a horse-reaper of the same character as employed in cutting wheat and oats. The threshing is performed with an ordinary wheat-threshing machine.

Rice straw differs from the straw of most other small grains in not being hollow. It carries comparatively little silica, is soft and spongy, and hence makes an excellent stock food. Cattle relish it highly, and its percentage of nutriment ranks well up—almost as much so as first-class English hay.

I believe that this about covers the grounds marked out in your letter of inquiry, and I hope that I have made it full enough and reasonably plain.

P.S.—There are no books on rice-culture, as practised in this country that I know of, and certainly none on kiln-drying of corn

Major Walthall gave some interesting particulars as to the corn (maize) industry in the Southern States, in which he said he never heard of kilns.

Mr. Turner stated that the fact was well known that American corn kept well, while our native product did not. Perhaps the climate made the difference.

Mr. Daly said there was a vast difference between our climate and that of the United States, and it might easily be understood that corn could be packed and kept in a dry atmosphere, much better than in one like ours.

The thanks of the Society were given to Major Walthall for the trouble he had taken in forwarding the information, and he was requested to thank Mr. Stelle in the name of the Society for his interesting communication.

The meeting then terminated.

Meeting held on the 14th November.—G. H. Hawtayne, C.M.G., C.M.Z.S., F.R.G.S., President, in the chair.

There were 15 members present.

Elections.—Member: Dr. R. Carter.

Associate: Mr. T. Wyatt.

The President said that before proceeding to the business of the meeting, it was only right to call their attention to the fact that since they last met, the Society had lost its honoured Vice-President. Mr. D. C. Cameron had not only been a useful member of the Society, but also a very valuable member of the community. He felt that they could not pass over the painful fact of his loss in silence, but rather put on their records their great

appreciation of his value, and sincere regret at his loss. He would also recommend that the Society forward to his widow, in a most respectful manner, an expression of their heart-felt sympathy with her in her great bereavement.

Mr. Julius Conrad spoke in favour of the President's recommendation, saying that he felt they had lost a friend indeed who had always taken a lively interest in the colony, and who could hardly be replaced by any other. He supported the Chairman in thinking that it would be a token of their appreciation of his services to forward an expression of sympathy to Mrs. Cameron.

The meeting having agreed to the recommendation, the Secretary was directed to forward to Mrs. Cameron an expression of the Society's great sympathy with her in her serious loss.

The Secretary read a letter from the Committee of Correspondence, informing the Society that they had reconsidered their decision as to the final abandonment of Country Exhibitions, and now think it desirable to try another part of the colony than Buxton, and also that the Exhibitions should be carried out on less ambitious lines.

In reply to a question of Mr. Davis, the Treasurer said that about \$820 remained on hand from the grant for Country Exhibitions.

Mr. Davis moved, and Mr. Legge seconded, "that the Report of the Committee of Correspondence be referred back to that Committee, so that it may be carried into effect;" which resolution, being duly carried, the Secretary was directed to communicate accordingly.

On the matter of the discussion of Mr. Abell's paper

on "Economising Sugar Carriers," the Secretary informed the meeting that Mr. Abell was prevented from attending, and invited discussion. No response being made, the matter dropped.

The Secretary read a letter from Mr. J. P. Prass, (which had been forwarded with a chart), advocating a water-way connecting the Demerara and Essequebo Rivers through Tenabo.

The thanks of the Society were accorded to Mr. Prass.

Mr. Mackay brought forward his motion, of which due notice had been given, that a Horticultural Exhibition be held during next year under the auspices of the Society. Mr. Mackay said that he need not dilate on the usefulness of such Exhibitions in other countries, as it was well-known what improvements had come through these means. They were trying to introduce the Fruit Industry into the colony, and one result of that would probably be fruit-canning. Why should not the fruits of this country be preserved in tins instead of the old clumsy confectionery bottles? He had packed a tin of guava jelly which turned out very well, and he knew no reason why the article could not be always packed in the same way. Since the Horticultural Exhibition at the Botanic Gardens in 1884, he had noticed a great improvement in the gardens of the Bourda District, and he thought that this was partly due to that Exhibition. He proposed that this Exhibition should be on a large scale, with, if possible, electric light in the evening.

Mr. Little seconded the motion for the sake of discussion, but at the same time, he said, his experience went against these Exhibitions, as very little interest had been taken in them.

Mr. Conyers supported the motion, saying, that the tendency of the Exhibition was to encourage the cultivation of a taste for flowers, and if they had been held regularly as originally proposed, he had no doubt they would have been a success.

Mr. Julius Conrad said that such an Exhibition was more within the province of the Botanic Gardens, and Mr. Davis thought that the improvement noticed by Mr. Mackay was due to the same Gardens.

Mr. Ritchie supported the motion, and Mr. Daly said he always supported such Exhibitions, but in this case he dissented because he wanted to have a proper Show in 1891, so that some of the Exhibits might be sent to the Great American Exhibition of 1892.

The motion was then put to the vote and lost.

The thanks of the Society were presented to Mr. Binney for the donation of a work entitled "Australian Irrigation Colonies."

The President informed the meeting that he had received the following donations for the Museum:—

Messrs. Hogg, Curtis & Campbell ... £50 0

The Proprietors of Taymouth Manor ... 10 10
for which cordial votes of thanks were given.

Mr. Davis asked the President whether it was the intention of the Board of Directors to invite the opinion of the meeting as to a rule lately passed by the Board "that New Books should lie on the table for 7 days;" to which Mr. Hawtayne replied that, in accordance with Chap. XV., Bye-law 2, the Directors have power to make rules for the management of the Society.

The President called attention to the fact that the next meeting would be the one for the election of Office.

bearers for the coming year, at which he hoped there would be a good attendance.

Mr. Davis gave notice of motion for next meeting as follows:—

That in accordance with Chap. III., Bye-law 9, Local Secretaries be appointed in different districts throughout the colony.

The meeting then terminated.

Meeting held on the 12th December.—G. H. Hawtayne, C.M.G., C.M.Z.S., F.R.G.S., President, in the chair.

There were 18 members present.

Election.—*Member*: Mr. L. P. Gallwey.

The Secretary read a letter from the Committee of Correspondence informing the Society that it had been decided to postpone the consideration of the question of the next Country Exhibition until after the election of Office-bearers for 1890, in order that the new Committee that would be charged with carrying out the plans should also initiate the work. This letter was taken for notification.

The President then addressed the meeting, giving a *résumé* of the work of the past year:—

Gentlemen,—I desire with your permission to follow the example of my predecessor, and to lay before you a short *résumé* of the transactions of the Society during 1889. In doing so, I confess that the expectations and hopes which were entertained at the commencement of my year of office have not been realised, and I am sensible that what has been done is largely overbalanced by what has been left undone. At the same time, those entrusted with the conduct of the Society have done their best to maintain its prosperity and its usefulness;

and I beg to record my thanks to our Secretaries, Mr. L. M. Hill, and his successor Mr. Daly, to the Treasurer Mr. Conyers, and to Messrs. Quelch and Rodway for their cordial and valuable assistance to the President on all occasions.

On the 1st January last, the members, associates, and lady subscribers numbered 399; of these 52 have ceased to belong to the Society, but we have added 122 names, so that the net increase in the Society's roll is 70. Death has deprived us of six members and associates. Messrs. G. A. Forshaw, E. E. H. Francis, D. C. Cameron, Dalgleish, Garratt, and Stack. I shall not be making an invidious distinction by saying that the three first named were men valuable not only to the Society but to the community at large, and whom it will be difficult to replace. Absence from the colony accounts for the loss of other members and associates, many of whom we hope to regain on their return.

We have also to regret that Mr. Walker, resident director in London, has resigned that office on account of his age and failing health. Mr. Walker has been connected so long with this Society, and has done us such constant good service, that I am sure he will receive from members an expression of hearty thanks for his assistance, and of deep regret that the connection is severed.

The funds of the Society will be reported on in due time by our Treasurer—who will, I hope, be able to state that they are in a sound condition.

The average attendance at the ordinary meetings has been 14 and a fraction. Although this may contrast favourably with former years, when a vigorous "whip" was sometimes required to ensure a bare

quorum of seven, it is not satisfactory to find that only 45 members have attended the eleven meetings. Of these, fifteen have attended only one meeting, and two or three others have been present as officers of the Society, so that it may be said that only about 27 out of 200 members take sufficient interest in the Society to induce them to attend its meetings occasionally. If the figures are further analysed it will be found that of the 45 members putting in an appearance at the meetings, only 21 are engaged in or connected with agriculture and commerce, the balance being made up of professional men and public officers. The absence from the meetings of gentlemen representing the agriculture and commerce of the colony, to further which interests the Society was founded and to whose support the Society has a just claim, has caused me much disappointment. I can only hope that my successor will be more fortunate in obtaining a larger amount of their support and co-operation.

The subjects which have been considered at the meetings of the Society, although not many, have been of interest and utility. They include what may be termed the Banana Industry Question, Fruit culture and packing, Cable communications, Corn drying, Starch manufacture, Sisal Hemp and Economising Sugar Carriers. One of the most important matters has been the constitution of a Chamber of Commerce which, although not directly created by this Society, owes its origin to the Commercial Committee called into existence on the suggestion of Mr. Davis. The Chamber of Commerce supplies a want which has long been a reproach to the business people of the colony. Its deliberations are

being directed to questions of much importance, some of which necessarily trench on the province of politics which is forbidden ground to this Society, while the Commercial Committee still has before it a wide field of subjects connected with the commerce of the colony, with which it can legitimately and profitably deal.

The Museum of the Society has prospered under the care of Mr. Quelch, who has recently returned to his duties, bringing with him renewed energy. We may expect large additions to our natural history collection, which will make the Museum more attractive than ever. The Museum, however, ought to contain more than specimens of natural history and the like. The Museum of an Agricultural and Commercial Society should, I think, have within its walls a complete collection of specimens of what we can grow and make, and what we buy and sell. It should be the colony's sample room where a visitor on business or pleasure can learn what we can supply and what we require. For all these, however, space is wanted, and with this view an attempt was made to obtain a legislative grant to enable us to extend our premises. That attempt failed owing to those who hold the purse-strings not thinking it practicable or prudent to grant the means; but our advances were not so wholly discouraged as to forbid the application being renewed, and I hope that with a better financial condition of the colony and brighter prospects than existed at the beginning of the year, our petition may yet be granted, and the means afforded of extending the Museum from which so many of the humbler classes derive instruction and entertainment, and which can in the way just indicated be of

material service to the agricultural and commercial interests of the colony. It is also desirable to increase our collection of native or local specimens for the purpose of exchange with similar institutions. Mr. Quelch has by these means already enriched our Museum, and I hope that we may in time add to it a considerable number of interesting objects. That the museums at home are willing to assist this institution has been shewn by the readiness with which the British Museum authorities assented to my request and sent to the Society the impressions of incised writings now in our library. We ought also, I think, to have specimens of the raw materials from which the manufactured articles familiar to us are made. We have a case shewing the various products derived from coal tar and a more recent collection of the minerals which form the basis of paints; and I think similar exhibits to these would form an attractive and instructive series.

In another direction we can claim some degree of success. Our Curator laid before us the absolute necessity of providing cases for the better accommodation and better exhibition of the Museum specimens. I took upon myself to apply to several of those who are connected with the colony, and who, though absentees, might be accredited with a desire to extend the usefulness of our Museum, and the result has been the following subscriptions: E. G. Barr, Esq., \$480; Messrs. Hogg, Curtis, Campbell & Co., \$240; Mrs. Williams, \$240; Hugh Sproston, Esq., \$48; J. McConnell, Esq., \$240; Proprietors of Taymouth Manor, \$50 40; Stewart Gardner, Esq., \$100; Sandbach, Tinne, & Co., \$100; Colonial Company, Ltd., \$120; G. Garnett,

Esq. (cost of case), \$40 ; or a total of \$1,658 40. This sum will enable Mr. Quelch to display some of his treasures more effectively—but, like Oliver Twist, he wants “more,” and we must hope that the example of those liberal donors just mentioned may be followed by more of the many, who, though absent from British Guiana, still retain an interest in, or derive profit from the colony.

The Directors have been able during the past year to complete the extension of the Reading Room, giving more accommodation to members, and also affording greater convenience to the public when visiting the Post Office. These additions have also added to the completeness of our façade in North Street.

The Society, in its desire to foster the cultivation of products other than our staple, and to benefit the labouring classes, endeavoured to get up an exhibition on the East Coast, to which it was hoped the people would contribute. Gentlemen whose time could with difficulty be spared for this purpose, interested themselves in the project, and no endeavour was spared by them to induce labourers and artisans to take interest in the exhibition. But without avail. The apathy or ignorance of the people, and the worse than ignorance of others who considered it their mission to sow distrust and dissension, rendered the disinterested efforts of the Society and the Exhibition Committee abortive. It has been determined, however, to make another attempt in another part of the colony where we hope that better results will follow, and that we may reap in Essequebo, or elsewhere, a success which has been denied us in Demerara.

Our library, over which Mr. Rodway so efficiently

presides, has been increased by 700 volumes. The Book Committee have had a somewhat difficult task in exercising economy while endeavouring to add to the utility and attractions of the library. They have had to avoid loading our shelves with books which would be read by few or less than those who propose their purchase—to keep up a supply of books of science, travel, history, biography, &c., and to keep within due limits the demand for works of fiction and ephemeral interest; in other words, to make our book room neither a collection of high and dry literature nor a mere second-rate circulating library. Arrangements have been successfully made for the more prompt executions of book orders. There has been a marked increase in the issue of newspapers since they have been rendered acceptable to members, while of magazines there is a larger supply and a corresponding greater demand for them, and the classification of the library enables a reader to get what he wants, so that novels and treatises no longer find their way to the wrong persons.

The Popular Science Lectures have been maintained, and continue to attract fair audiences. Our thanks are due to those who have so kindly delivered lectures or aided in their illustration, and I am glad to be able to promise a succession of lectures during next year, which it is hoped will be appreciated by larger audiences. In laying down the office to which you elected me last year, I beg to offer you my thanks for the honour you then paid me, for the indulgence you have shewn me, and also to express my sincere hope that the new year, the forty-seventh of our Society's existence, may bring with it success and prosperity.

The Rev. T. J. Moulder proposed a hearty vote of thanks to the President for the very able manner in which he had conducted the meetings during the past year, and especially referred to the Science Lectures and Museum extension as examples of Mr. Hawtayne's work. Mr. C. P. Austin seconded the motion, which was heartily carried. Mr. Hawtayne thanked the meeting for their expression of approval of his services, and hoped that the new President would do even more than he had done.

The President informed the meeting that Mr. W. Walker, the Society's Resident Director in London, had, on account of increasing age and declining health, placed his resignation in the hands of the Directors, which they had been reluctantly compelled to accept. He was sure they would all feel regret at hearing of Mr. Walker's decision ; he would therefore move the following resolution :—

“ That the Royal Agricultural and Commercial Society of British Guiana, in accepting the resignation of Mr. Wm. Walker, its Resident Director in London, desires to record its deep sense of his valuable services during a period of over twenty years, and its regret at the severance of a connection which has been so beneficial to the Society.”

Mr. R. P. Drysdale said he had much pleasure in seconding the motion. Mr. Walker had served them long, well and faithfully, and therefore they could not part with him without expressing their regret and sorrow at the loss of his services. They all knew the reason, old age and infirmity creeping on disabled him from taking part in affairs which he would still be willing to continue if able. They were losing a valuable member,

and they could only express their regret at the reasons which necessitated his retirement.

Messrs. Davis, Daly, and Austin also spoke in favour of the resolution. They had all known Mr. Walker, and spoke feelingly of his friendship with them individually, as well as his keen interest in the progress of the colony.

The resolution was carried unanimously, and the Secretary directed to forward a copy to Mr. Walker.

Mr. N. D. Davis gave notice of motion as follows:—

That a Committee of Members of this Society be appointed, in order to take steps to ascertain whether it be practicable to induce agricultural labourers of the African race to immigrate from the United States to British Guiana.

Mr. Davis said his reason for this motion was that a rabid spirit against the negro was growing up in the United States, and if the Americans did not want these people British Guiana might take them, if they were willing to come.

The Rev. A. H. Leslie gave notice of motion as follows:

That in view of the uncertain terms of residence in the colony of Wesleyan Ministers, such Wesleyan Ministers as are at present, or may hereafter be elected Members of this Society, shall be allowed to make quarterly subscription payments, instead of yearly, to the Treasurer of this Society.

The election of Office-bearers for 1890 was then proceeded with, Mr. R. P. Drysdale being elected President on the motion of Mr. N. D. Davis, seconded by Mr. Jacob Conrad, and Mr. B. H. Jones Vice-President on that of Mr. Davis, seconded by the Hon. C. P. Austin.

The other Office-bearers were duly elected as per accompanying list.

Mr. Davis brought forward his motion for the appointment of Local Secretaries, of which due notice had been given, which being seconded by Mr. Drysdale, was duly

carried, the consideration of nominations being postponed for consent of the parties willing to accept the office.

The thanks of the Society were accorded for the following donations:—

To Library.

Trustees of British Museum—17 Catalogues and 11 Guides.

Mrs. Horatia Sproston—Fitzgerald's History of the British Stage.

Dr. B. E. C. Belmonte—The Administrator General's Department.

To Museum:

The Government per F. W. Collier, Postmaster-General—A collection of Postage Stamps, Cards, &c.

Mr. Brooke Alder—Specimens of the Mineral Bases of Paints.

The meeting then terminated.

Office-Bearers for 1890.

Patroness:

THE QUEEN.

Vice-Patron:

**THE RIGHT HONOURABLE VISCOUNT GORMANSTON, K.C.M.G.,
GOVERNOR AND COMMANDER-IN-CHIEF, &c., &c., &c.**

President:

R. P. DRYSDALE

Vice-President:

HON. B. H. JONES

Honorary Secretary:

THOS. DALY

Honorary Treasurer:

F. A. CONYERS

Ordinary Directors:

S. M. BELLAIRS

N. D. DAVIS

FERRIS GRANT

T. H. GLENNIE

G. H. HAWTAYNE, C.M.G., F.R.G.S., C.M.Z.S.

JOS. MONKHOUSE

Managing Directors:

H. KIRKE, M.A., B.C.L.

W. S. TURNER

F. A. R. WINTER

Exchange Room Directors:

A. G. CLARKE

A. WEBER

C. WIETING

Agricultural Committee:*Chairman*, HON. B. H. JONES*Vice-Chairman*, A. BRAUD*Secretary*, GEO. GARNETT.

ROBT. ALLAN	J. GILLESPIE
GEO. BAGOT	A. R. GILZEAN
HON. A. BARR	E. C. LUARD
HON. C. L. BASCOM	J. MONKHOUSE
S. M. BELLAIRS	G. MONRO
R. B. BUTTS	T. MULLIGAN
B. R. CLARKE	P. H. NIND, M.A.
S. R. COCHRAN	JAS. SMITH
JOS. B. FINNEY, C.E.	WM. SMITH
J. M. FLEMING	W. A. WOLSELEY

Commercial Committee:*Chairman*, J. J. DARE*Vice-Chairman*, J. S. HILL*Secretary*, G. GARNETT

HON. A. BARR	E. McLEOD
B. S. BAYLEY	JOS. TENGELY
JACOB CONRAD	JAS. THOMSON
WM. CUNNINGHAM	W. H. SHERLOCK
J. H. DeJONGE	A. SUMMERSON
R. P. DRYSDALE	JAS. STUART
J. P. FARNUM	E. T. WHITE
FERRIS GRANT	

Committee of Correspondence:*Chairman*, G. H. HAWTAYNE, C.M.G., F.R.G.S., C.M.Z.S.*Vice-Chairman*, W. S. TURNER*Honorary Secretary*, J. J. QUELCH, B. Sc.*Treasurer*, F. A. CONYERS.

ROBT. ALLAN	J. B. FINNEY, C.E.
HIS Hon. N. ATKINSON	G. GARNETT
SIR CHAS. BRUCE, K.C.M.G.	FERRIS GRANT
GEO. BAGOT	G. S. JENMAN, F.L.S.
S. M. BELLAIRS	HON. B. H. JONES
A. BRAUD	H. KIRKE, M.A., B.C.L.

REPORT OF SOCIETY'S MEETINGS.

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COL. HON. R. S. COTTON
E. H. G. DALTON
P. P. FAIRBAIRN

GEO. LITTLE, JNR.
F. A. MASON
A. SUMMERSON

Curator of Museum : J. J. QUELCH, B. Sc. (Lond.), C.M.Z.S.

Book Committee:

DR. ANDERSON
HIS HON. N. ATKINSON
HON. C. P. AUSTIN
HON. J. W. CARRINGTON,
 D.C.L., C.M.G.
E. H. G. DALTON,
N. D. DAVIS
J. B. FINNEY, C.E.
GEO. GARNETT
FERRIS GRANT
G. H. HAWTAYNE, C.M.G.,
 F.R.G.S., C.M.Z.S.

H. KIRKE, M.A., B.C.L.,
C. H. G. LEGGE
REV. T. J. MOULDER
J. A. POTBURY, M.A.,
EXLEY PERCIVAL, B.A.
REV. W. B. RITCHIE, M.A.
HIS HON. W. M. SHERIFF
E. J. N. THOMAS
J. VEECOCK
S. VYLE
W. T. WALTHALL
F. A. R. WINTER

Librarian : JAMES RODWAY, F.L.S.

Resident Director in London :
E. G. BARR, Holland Park.

List of Popular Science Lectures.

“BOOKS; THEIR NATURAL HISTORY.”

*Delivered on Tuesday, July 16th, by Seaforth M. Bellairs, Manager,
Pln. Chateau Margot.*

HE lecturer began by explaining that he did not intend to treat his subject from the literature point of view, but (so to speak) from the stand-point of the natural history of Books. He then gave a description of the term “Book,” historically treated; and from the earliest form, that of object or picture-writing, traced, in detail, the various forms of writing by different races throughout their developments and conventionalisations, up to modern times. He then proceeded to describe the various materials employed for these various forms of writing at different periods and by different nations.

8.—“STEAM AS A MEDIUM OF POWER.

Delivered on Tuesday, August 27th, by T. S. Cornish, A.M. Inst. C.E.

The lecturer began by defining the term “steam,” and limiting its treatment in the lecture to steam that has been formed from boiling water. He then gave a detailed historical description of steam engines, or engines by means of which steam was made to do work, tracing the gradual improvements and complexity of their mechanism from the earliest recorded times up to the present, and indicating the reasoning of the processes by which the heat of steam is either made use of as

potential energy or is rejected as heat. Detailed reference was then made to the utility and advantages of condensing and non-condensing engines in the sugar industry, and the advantages of compound over single cylinder engines.

9.—“SOME INDIAN GAMES.”

Delivered on Wednesday, September 25th, by E. F. im Thurn, M.A. (Oxon), Special Magistrate, Pomeroon.

This lecture, which is incorporated in the paper on Primitive Games, page 270, was illustrated by Magic Lantern slides, prepared by Mr. H. H. Cunningham, and exhibited by Mr. E. C. Luard.

10.—“SOME FRAGMENTS FROM THE NATURAL HISTORY OF GUIANA.”

Delivered on Tuesday, November 26th, by J. G. Quelch, B. Sc. (Lond.) C.M.Z.S., Curator of the Museum.

The lecturer began by limiting the scope of his remarks to the consideration of the type of organisation presented by the Marsupials, the Edentates, the tapir, and the Platyrrhine monkeys of the colony, and to the distribution and origin of these local types. The forms allied to these types in different parts of the world, were referred to ; the great zoological regions were described ; and the nature of the Fauna in the most recent of the zoological periods, as denoted by fossil forms, was pointed out and contrasted with these recent types. The earliest types, related to those selected, were then pointed out, and the lines of their modification and the path of migration to the Southern Continent indicated.

The lecture was illustrated by specimens and diagrams





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